

american **aircraft** **MODELER**

AUGUST 1969 60c (7/-)



FOR THE TENDERFOOT
**START YOUR
ENGINES!**



Build this magnificent
radio-control model:

Gerald Leake's realistic

JUNGSTER

Full-color centerspread

1918

British S.E. 5a

NEW

ents

scaler

O.S.

ENGINES R/C SYSTEMS

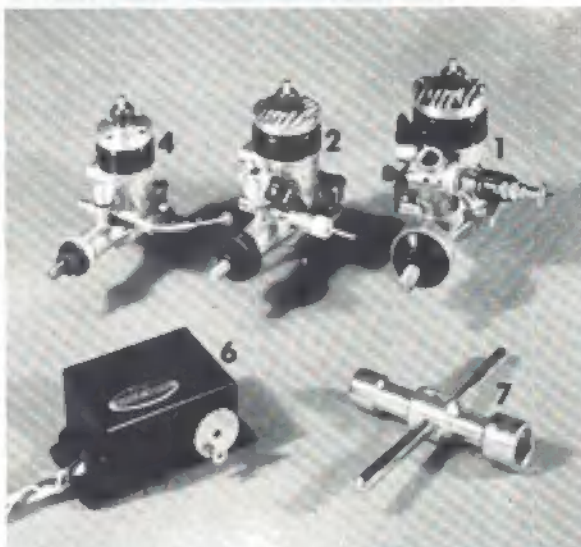
FOR SMALL R/C SMALL OS ENGINES

Mr. Ogawa of OS has been making engines since 1939. Some of the first engines he made looked like the old Denny Mite. The early post war years saw a rash of Diesels and a twin stacked 29 that at one time held an endurance record because of its extremely good fuel economy. Today OS builds a wide range of engines from the tiny .06 up to the Max 60 R/C. We will cover the merits of the larger engines in another ad some day but today we want to talk about the really strong suit of OS — his small, light, precision R/C engines. For the last two or three years these engines have been in such short supply that it was almost embarrassing for World Engines. In the last year, we have worked out an increased production agreement with OS which has finally paid off. We can actually say that in this point in time, we have a nice stock of small OS engines in stock. This includes the all time favorite, the Max 15 R/C — \$16.98. This is a compact, light weight, little lapped 15 with a beautiful throttle. The 19 — not shown — is a little larger, not just a bored out 15. (2) This is the Pet .09 R/C. This engine runs well and has a throttle and sells for the very low price of \$7.98. (3) the 10 R/C — \$12.98 — is a higher quality engine than the economical Pet .09 and has a more sophisticated throttle with an exhaust wiper. The porting in the .10 is also substantially different than it is in the .09. (4) The Max .06 is the smallest engine that OS makes. Some day we hope to offer it with a throttle. \$9.98.

WORLD ENGINES · OS'S R/C SERVICE CENTER

Note: For some of these numbers you will have to look in either picture. (5) The S-30 R/C Marine is complete with a water cooled head and a water chamber in the crankcase backplate. Complete with throttle \$26.98. (6) This is OS tiny single channel servo. This comes as the S-103 for rudder — \$13.98, as the S-104M — \$12.98 — for motor control, and the S-101W — \$11.98 — for Pulse. For information on the range of OS R/C products, please see the column at the right.

(7) This wrench fits the standard glow plug and also the prop nut on either the OS 15 or 19. 75¢. (8) OS 3 Channel Proportional. This even includes trimmable motor control. An exceptional value at \$199.98. This equipment is serviced in Cincinnati by the Controlaire Division of World Engines, Inc.



O.S. ACCESSORIES

Space in this advertisement prohibits covering these accessories in any great detail. OS manufactures mufflers for the Max Series engines, from the 10 all the way through the Max 60 Series. All of these mufflers have R/C baffles in them except for the 60. Spinners — there are two small needle nose type. The smaller fits the 15-19 range and the larger fits the 29 to 58 range. The larger has the 1/4-28 thread and can be used on other engines. They also make a new streamlined spinner that fits the 1/4" prop shaft.

Max 10-19 R/C Muffler	\$ 2.98
Max 30-58 R/C Muffler	3.98
Max 60 Muffler	6.98
Marine Universal — 09	1.00
Marine Universal — 15-19	1.25
Marine Universal — 29-40	1.75
Marine Universal — 50-58-60	1.95
OS AMA Prop Nut — 1/4-28	.79
OS AMA Prop Nut — Max 15-19	.09



R/C Engineers from Controlaire have been working steadily with OS to try to build some interchangeability and compatibility to the two systems. Because of the difference in component that are available to OS in Japan, the systems are not identical but resemble each other in many ways and, therefore, our Service Engineers can fix most anything that is wrong with an OS set. The single stick 3 Channel Proportional should be of exceptional interest to the many single stick flyers about the nation. OS also makes the conventional 2 stick version in 4 channel. Their 3 channel gear is extremely popular as the price is very low for the quality that is inside. Also, single channel flyers do not overlook the single channel superhet combo that is ready to go for \$49.98.

OS 4 Ch. 1 Stick	\$
OS 4 Channel Pro	319.98
OS 3 Channel Pro	199.98
OS Tx Stick Kit	14.98
1 Channel Pixie 5/Het Combo, Tx, Rx, Servo, Batt. Bx., Switch, Wired	49.98
1 Ch. Pixie Tx	19.98
1 Ch. Pixie Rx Regen.	13.98
1 Ch. Minitron 5/Het.	32.98
1 Ch. Rudder Servo S103	13.98
1 Ch. Motor Servo S104M	12.98
1 Ch. Pulse Servo S101W	11.98
OS 7 Pin Connector	1.29
OS 4 Pin Connector	.98
OS 50 Ohm Relay	2.98
OS 100 Ohm Relay	2.98
OS Propo Servo	30.00

PROPO TIME
PAYMENT PLAN
APPLICATIONS IN
EVERY CATALOG
.75

TOP FLITE INTRODUCES THE NEW R/C PRECISION SCALE

S.E.5a

AUTHENTIC IN EVERY DETAIL... BUT ONE!

CAN YOU FIND IT? *

Never before has an R/C scale model been engineered with such measurable accuracy from the wing dihedral and tail area to the most minute incidences. Never before has an R/C scale model been designed with such attention to the most insignificant detail.

Dave Platt, Scale R/C Champion, and designer of the Dauntless, the only scale model ever given a perfect scale score at any NATS (1968), has outdone himself in designing this S.E.5a.

Yet, with all this attention to detail and scale, the S.E.5a combines a ruggedness and flying-field performance seldom found in any model.

If quality, attention to detail and flyability are your criteria of value, the S.E.5a is the model for you.

Wing span: 52"
Wing Area: 1000 Sq. In.
Engines: .45 to .60
Kit RC-13
\$45.00

CONTACT! That's the command Captain "Mick" Mannock of the British Royal Flying Corps gave as he revved up the engine of his S.E.5a and led his squadron into battle against Germany's best, the Flying Circus.

Top Flite's S.E.5a is an authentic-in-detail copy of Mannock's personal "mount," which helped him down at least 73 enemy planes, the most victories ever won by a fighter pilot in WWI.

Just building the S.E.5a will give you a never-to-be-forgotten thrill... and flying it will let you revel in the romance of World War I flying.

NEW IN S.E.5a KIT

- Nylon strut fittings solve the biplane problem of alignment and assembly
- Machined air foil section wing struts
- Stamped metal cowls
- Scale display prop
- 2 full sized waxed plan sheets (including both wings)
- 2 gigantic fuel proof authentic matte finish decal sheets
- Plus the finest quality balsa, nylon and metal parts and fittings money can buy



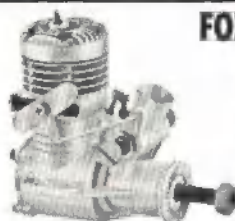
• The switch in the fuselage at the lower wing root.
—but you can even hide it if you like.



TOP FLITE MODELS, INC. • 2635 S. Wabash Ave., • Chicago, Ill. 60616

Quality American Craftsmanship By

★ FOX ★



FOX 29x R/C

Bore738
Stroke700
Disp.299
Wt. 8 oz.

\$19.95

A beautifully running, relatively high speed 29. One piece crankcase design with slip liner. Lapped meehanite piston. Triple jet full suction carburetion. Switch type exhaust valve. Needle bearing main. Reliable idle. Ideal for small multi's and Goodyear racer types.



FOX FUELS

COME IN THREE FORMULAS

Superfuel — A mild fuel featuring 5% Nitro and 28% Castor — High Oil Content. Favors hot weather and bushing motors.

Pr. \$1.05 Qt. \$1.79 Gal. \$5.95



Duke's Fuel — Now has 21% Oil and 10% Nitro. Good all around formula for needle bearing or ball bearing motors. Used a lot in R. C. Gallon \$6.50



Missile Mist — 25% Nitro and 27% Oil gives real snappy performance. Nitro is buffered to reduce preignition.

Pr. \$1.20 Qt. \$2.10 Gal. \$7.50

FOX GLO-PLUGS

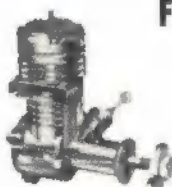


Here are the world's best dual-range Glo-Plugs. The rhodium alloy element starts quicker, idles better, runs faster and lasts longer than conventional platinum elements. The synthetic insulators do not crack with wrench torque or cause heat dams to make engine preignite.

Standard Long or Short \$1.49

Heavy-Duty Long or Short \$1.75

R/C Long or Short \$1.98



FOX 35 STUNT

Bore800
Stroke700
Disp.352
Wt. 6 1/4 oz.

\$16.95

For immediate shipment. The Fox 35 Stunt has won more contests throughout the world than all competitors combined. No other motor is so completely dependable, so steady in power output, so understanding of "pilot error." The perfect motor for either the beginner, or the old pro.



FOX MFG. CO.
5305 TOWSON AVENUE
FORT SMITH ARK 72901

american aircraft MODELER

VOLUME 69, NUMBER 2

AUGUST 1969

COVER PHOTO: This lovely bucolic scene—to a modeler's eyes — includes Oscar Weingart's gorgeous Grumman Widgeon amphibian, an excellent flyer. Picture by Frank Pierce. The Widgeon is a great all-time modeling subject. Twin Enya 60's.

WILLIAM J. WINTER — PUBLISHER

Edward C. Sweeney, Jr., Editor

Sally Barry, Managing Editor

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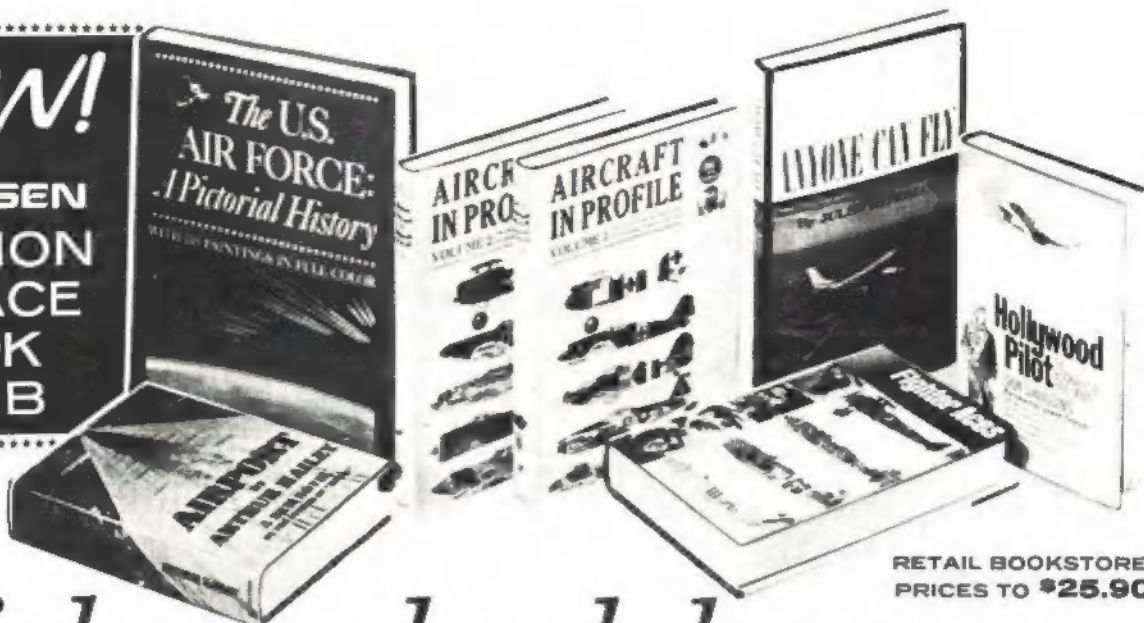
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If you really LOVE aviation and adventure... If you love hangar-flying those missions over Korea and during World War II... If you get charged up just THINKING about aircraft—anything from the good old days of open cockpits and white scarves, to the instrument console in the Lunar Module—then you definitely are our kind of guy!

Here's the point of the new Jeppesen Aviation & Space Book Club: Most sky men like you don't sit around reading Ralph Waldo Emerson and Will Shakespeare. But there are a lot of books you do want, on aviation and space. Reference books that hold all the poop on aircraft designs from Kittyhawk to the F-111. Books that recall great moments in the history of aviation. Exciting accounts and experiences by famous flyers and biographies of pilots who really lived life right down to the line. Books for those who seriously want a career in the lucrative aviation and space field. How-to-do-it books. Books on flying technique... on latest equipment on VFR and IFR flight instruction. This Club is designed to bring you all these books, and more!

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The 6 Club Selections described at left give you an idea of the money you save as a member. Com-

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If you want the monthly Selection, do nothing. It will come automatically about 3 weeks later. If you don't want the Selection, or prefer one of the Alternates, simply tell us so on a handy form which we always provide. You only buy books you really want!

RISK-FREE GUARANTEE! If you aren't absolutely nuts about us when your first Selection arrives, just return it. We'll cancel all charges, cancel your membership, and you can forget the whole thing! Pick your bargain book and mail the Trial Membership Form today, to the Jeppesen Aviation & Space Book Club, 8025 East 40th Avenue, Denver, Colorado 80207.

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Name _____

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City/State _____ Zip _____

If you are under 18,
please have your
parent sign here _____



STRAIGHT AND LEVEL



Did you know that magazines are constantly searching for new material. What's your thing?

WITH the kind indulgence of you readers who rightfully expect a nobler message than this one, we shall permit ourselves the luxury of "beating the bushes" for more and better material for publication. All the magazines constantly need new material, new fresh ideas and original concepts. But whereas every hobbyist once fancied himself a potential contributor, possessing the model everyone would want to build, or the article everyone would have to read, these days an editor practically has to pluck talent from among a shy mob of wall flowers.

The apparent drying up of talent surely is an illusion. How would you explain it? Perhaps, when magazines were kind of rough and ready, we all identified more readily. Many readers may have belonged in a more informal sense, and had self-confidence. Now, maybe, they are more overawed. They certainly do exhibit an expectation that somebody else will always "publish" plans and things for their benefit. As we know, particularly from the rocketry people, the most talented and well-spoken modelers, seem to think that some special genius is required to "write." They are not writers. Who in the heck is? None of us need "writers." We do want your ideas. And tens of thousands of modelers, particularly kids and beginners of all ages, indicate they desperately need something to sink their teeth into.

How do you sell something to a magazine? This magazine's recommendation is that you query the editor. How do you do this? Write a short letter. Describe your proposal briefly. Do you wish to write an article? What about? Will you include rough sketches or finished drawings if needed? Or photos? Do you have a construction project? If so, can you supply a finished plan, or rough pencil working plan, and pictures? If it is a model, enclose a picture or two to help the editor evaluate the ship—to visualize what you are talking about.

He will say yes, no, or maybe. If there is action, he will tell you the sizes for the plans, the length of the article, and will give you guidance in its preparation. This approach narrows the possibility of wasted effort. You might have the finest project in the world—but the magazine may be holding one or more comparable projects and therefore cannot use yours. By a series of queries you can find a target—assuming you do have something worthwhile to offer. And if you are weak in some areas, the editor may have suggestions. He can arrange for finished drawings by some draftsman, for example.

What kind of material do magazines need? The greatest need is for plans and construction projects. How-to-do-it features, especially with sketches or pictures, also are as scarce as hens' teeth. There is an urgent and con-

stant need for decent free-flight items. The supply of control-line projects is spotty. Rocketry articles and projects are almost non-existent. (Presumably, rocketry fans are so well educated by Centuri and Estes materials, that they expect to be spoon-fed.)

We need articles and photo features on all sorts of techniques, from covering to construction, from starting engines to bending wire.

Do magazines make assignments? Yes, they certainly do. What kind of work will they assign? To begin with, there are always special models editors would like built. For example, Tenderfoot projects are required for this magazine. Simple, attractive, flyable, inexpensive stuff. They can be rubber or gas powered, or just gliders—or even radio control. A Tenderfoot is not necessarily a 12-year-old. He might be 50 or 60. Who knows? We'd encourage the development of interesting sport jobs of all kinds: ornithopters, helicopters, and off-the-beaten-path stuff, as well as practical small-field free flights (and they can be cabin, open-cockpit, high-wings or low-wings). Canards and pushers, autogyros, biplanes, flying saucers, or just pleasing, different lines on old standard configurations. And that goes for control-line and radio as well.

How do you qualify for assignments? Just tell us about yourself and your experience and capabilities. What can you do? What are your interests? Have you a competition record for example? Do you have writing experience of any kind? Can you make pencil drawings? Tracings? Have you done anything for a model airplane magazine before? Send any photos you have of your models. Are you a photographer? What kind of camera equipment do you own?

What do magazines pay for material? Roughly speaking, there are three broad categories, as well as assorted special cases worked out by negotiation. First, model designs. This depends on type of model, work involved, complexity of plans. Payment may run from as little as \$75 to as much as \$400. If the magazine must pay someone for a final, inked plan, that sum will be subtracted. Drafting work in general is paid for on an hourly basis. General articles range from \$50 to \$250, averaging \$100 to \$150. These are ballpark figures.

When is material paid for? Articles and construction projects are paid for approximately 45 days prior to newsstand dates. Assigned drawing and photographic work are considered services, and are paid for on approval. When circumstances require it, the editor will establish prices before work is undertaken.

And lastly, there is art work. Technical drawings. Pen and ink stuff, wash, air-brush techniques. Diagrams, charts, perspective details, cutaway drawings. What's your thing? A ducted fan, maybe? —The Publisher



CARL GOLDBERG

New! RANGER 42

The Versatile Almost-Ready-To-Fly Fun Model

For Single or Multi-Channel Radio Control; Also Free-Flight

Span 42"
Length 31"
Area 240 sq. in.
Weight 26-36 oz.

Can be flown 6 ways:

1. Single Channel Radio, Rudder Only
2. Single Channel Radio, Galloping Ghost
3. Two Channels, Rudder and Elevator
4. Three Channels; Rudder, Elevator, Engine Throttle
5. Four Channels; Rudder, Elevator, Engine Throttle, and Ailerons
6. Free Flight

Full explanation of each method given on plan.

FEATURES:

- One-piece molded Wing, high-lift
- One-piece molded Stabilizer
- One-piece molded Vertical Fin
- Molded Fuselage, completely assembled with firewall, nose gear, plywood floor, side rails, and main landing gear block already installed
- Complete fittings — nylon links, horns and keepers; nylon hinge material, screws, blind nuts, washers, eyelets, retaining springs, etc.
- Complete plans, with step-by-step illustrations
- Instructions on Operating Radio Control Models

For .049 to .10 Engines

Only **\$14⁹⁵** PRC1

Radio Control Flying is Fun! You can actually feel the thrill of controlling an airplane in flight — doing stunts, loops and rolls — and making it come back to you and land where you want. And the shortest way to success is with the unique new RANGER 42. This model has been carefully engineered, leaving only the simplest final assembly steps, all clearly illustrated. Flight stability is exceptional, as well as response to control. All you have to do is add your engine, wheels, and radio control — only 6 to 8 hours work — and you're ready to go FLYING! Just ask your hobby dealer — he'll be glad to show you the features.

SKYLANE 62

Semi-Scale Beauty in A Great Flying Model!

DELUXE — Includes New Fittings

1/2 A SKYLANE \$8⁹⁵

For Single Channel —
Escapement, Servo or Pulse
Span 42" Area 244 sq. in.
Length 35" Weight 22 oz.
For .049 Engines

Tough, roomy cabin and front end, takes single to 10 channels or proportional.

Steerable nose gear.
SPAN 62" AREA 540 sq. in.
LENGTH 50" WEIGHT 4 1/2 - 5 lbs.
FOR ENGINES FROM .19 to .35

Shoestring

The Goodyear Racer with Enough Wing Area and Stability so YOU Can Fly It!

\$24⁹⁵

DELUXE — Includes New Fittings

FOR 6, 8, 10 CHANNELS OR PROPORTIONAL

SPAN 54" AREA 540 sq. in.
LENGTH 44" WEIGHT 4 1/2 - 5 lbs.

FOR .19-40 ENGINES

Most Beautiful R/C Ever Kitted!

The Design That Makes The Simplest, Sound, Attractive Airplane

THE FAMOUS FALCON

SR. FALCON \$29⁹⁵

DELUXE — Includes New Fittings.
For 10 Channels or Proportional
Span 69" Area 810 sq. in.
Length 53" Weight 6 1/4 lbs.
For .35 to .45 Engines

FALCON 56 \$16⁹⁵

DELUXE — Includes New Fittings.
Takes Single to 10 Channels or Proportional
Rudder-Only or Multi-Training
Span 56" Area 558 sq. in.
Length 43" Weight 3 1/2 lbs.
For .09-.15-.19 Engines

Junior FALCON \$5⁹⁵

DELUXE — Includes New Fittings.
For Single Channel —
Escapement, Servo or Pulse
Span 37" Area 250 sq. in.
Length 28" Weight 16 oz.
For .049 Engines

World's FIRST Single or Twin Engine R/C Models

SKYLARK

DELUXE — Includes New Fittings

SKYLARK 56 \$18⁹⁵

Takes Single to 10 Channels or Proportional
Span 56" Area 528 sq. in.
Length 44" Weight 3 1/2 - 4 1/2 lbs.
For Single Eng. .09, .15, or .19
For Twin Eng. Use Two .09's or .15's

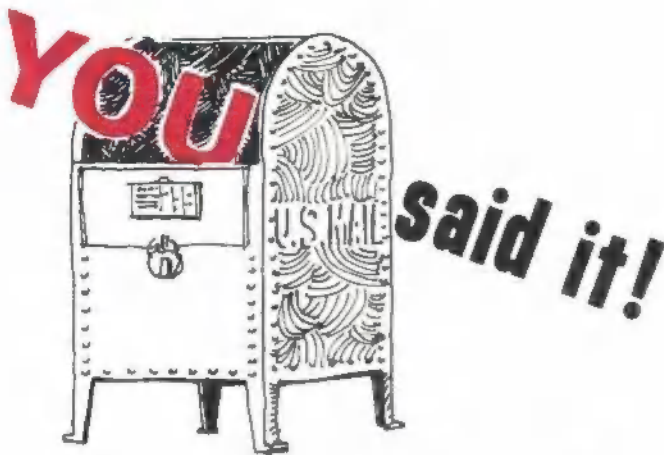
JR. SKYLARK \$6⁹⁵

For Single Channel —
Escapement, Servo or Pulse
Span 37" Area 235 sq. in.
Length 29" Weight 18 oz.
For Single Engine Use .049
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The 'elite' group

To the group of R/C flyers that seem to think the AMA serves no useful purpose for them, who in h... do they think they are? I flew R/C multi (reeds, remember them?) until cost got so high that I couldn't be in the running without propo. So now, I only fly F/F and U/C.

I never paid anyone to build my models for me! I was, as I still am, always ready to help anyone, of any age, kid or not. These self-centered, ungrateful clowns should all be made to fly their \$600 radio rigs in plastic toy airplanes. This "elite" group of fellows would have no competition standards, no contest data information, and none of the other advantages that we "poor, outcast, non-informed" AMA members have.

If, after thinking over all the progress and advantages of AMA in the past years, the "elite" still think they can do better by themselves (how they can work and lead a group when they are, for the most part, too lazy to build an airplane is beyond me), then I say let them go! The twenty thousand of us that will be "left in the darkness of non-R/C" can muddle through somehow.

Jerry Farr, Abilene, Tex.

We certainly agree that the unreasonable, uninformed concept of an independent R/C organization is bad for all of us. Might we ask what happened to the monies collected for such a purpose the last time this happened? These movements are not spontaneous, but led and inspired. Who stands to gain? Too many of us are swayed by the printed word. We'll believe anything. To justify such an organization it first is necessary to trump up charges against AMA, to distort truth, to destroy if necessary. For what genuine purpose? As to "toy airplanes" Jerry, we think you have it all wrong. In radio the name of the game is flying. Most R/Cers don't have the time to design and build from scratch. If we had to, we could not fly. It's mighty nice on a Sunday afternoon to be able to put one of these fine products into the air, to get over a tough week. We may prefer to build our own, but that is impractical. If we wish to build, there is always a leisurely free-flight, a glider, an ROG, or a profile control-liner. But, man, you cannot fly on the basis of building one R/C a year — if it prangs, you spend the season watching the other guys fly. Ed.

Facts of life?

I am 28 years old and am answering Robert Hayman's letter in the May '69 issue.

I built three hot rods before I was 18 on a teenage budget and can remember what you are going through now.

Let's face it, R/C is for people with money, adults, or guys with generous parents. No one owes you the time it requires to teach someone to fly. This sort of thing isn't exactly automatic. Further, now that most people are flying digital proportional, most fellows don't know the first thing about single-channel or GG.

What you need is another "facts of life" lecture.

Fly control-line or free-flight till you are ready. How do you think everyone else got started?

See you in ten years.

Russ Verbael, Pensacola Aero-Modelers, Pensacola, Fla.

Example for adults

Recently you have published many letters from younger modelers trying to get into R/C. One of their common problems seemed to be indifference on the part of adults.

I am 15 years old. Several days ago I went out to test-fly my R/C airplane. I was very fortunate to receive the aid of an adult flyer who wanted to help me. Because of his help, I was able to make several controlled flights. None of these was very smooth but I did manage to get the aircraft trimmed out.

I never did find out his name but I have written this letter in the hopes that other adult flyers will read it and follow his example.



'Say that's neat.....what is it?'

My only complaint about your magazine is that you never seem to have construction articles on single-channel trainers, or articles on adjusting them for flight. McEntee's articles help, but they don't deal with the actual flying of model aircraft, which is the topic most beginners are interested in.

Bill Kosor, Deerfield, Ill.

Any of you contributors got ideas? Ed.

Control that Mini-Glider

After several months of experimenting with the Mini-Glider by John Zaic, I have an idea that I would like to submit.

Author Zaic pointed out several ways to control the Mini-Glider. Weighted wing tips, tilted wings, offset wings, tilted stabilizer, washin and washout. I built several of these gliders, ten to be exact. I got one glider to make a flat circle without trimming the glider. This was accomplished by forming the wing with a slow, undercambered airfoil, and the other with a fast airfoil. The ratio of the two airfoils determines the flatness and diameter of the circle that the glider will make.

I hope this idea will help outdoor hand-launch gliders from making out-of-sight flights.

Jim Rezich, Rockford, Ill.

Revived interest

I was pleased to see the great editorial on rubber-powered scale, which appeared in the April '69 issue. I too think that rubber scale is a very rewarding and satisfying form of modeling. My interest in aircraft is scale modeling (free-flight and control-line), and I have been modeling for two and a half years.

The bulk of my modeling has been done with rubber-powered scale and I was beginning to tire of the tiny jobs. When I read your editorial I was pleased and inspired. It opened up new vistas of modeling for me. Thank you.

Are any of Mr. Ott's or Mr. Stahl's plans still available? Also your magazine is much better since you added the color center-spreads.

Andrew Cottle, Brooklyn, N. Y.

Unfortunately, Ott and Stahl plans are no longer available. Your best bet is back issues from some commercial supplier.

Ads sometimes appear in the classified section. Ott plans appeared in the old Popular Aviation around 1930. Stahl plans were in various magazines from the late Thirties until just after WW II. Ed.

Third aircraft?

Major William O'Dwyer is to be highly commended on his clinical inquiry into the death of Richthofen in the Feb. '69 issue. However, he admits a wealth of doubtful detail on other aspects of the incident.

With Floyd Gibbons (The Red Knight of Germany) and many other writers, Major O'Dwyer visualizes a three-plane chase low over the Australian lines. No contemporary report by or on behalf of the machine gunners who fired on Richthofen's all-red Fokker triplane makes any reference to a third aircraft; later accounts mention a third machine only to emphasize that none was present. The only other plane within thousands of yards was the one the "Red Baron" had been tailing.

As demonstrated by the present writer in the Summer 1963 and Spring 1967 Cross and Cockade, Capt. Brown evidently attacked a red-winged triplane in a running fight 5000 feet over the German front line. Who the German pilot was, or what became of him, has yet to be established.

Frank McGuire, Quebec, Canada

Ace who flew the Spitfire

I just noticed on your March centerspread of that beautiful Spitfire (my compliments to Bjorn Karlstrom) that it says "as flown by British Ace Wing Commander Douglas Robert Stewart Bader."

I wonder how many people know the story of Douglas Bader. Just before the Second World War, he had a terrible accident in an airplane while performing low loops over an airfield in England. As a result of this, one leg had to be amputated just below the knee and the other at mid-thigh. He was fitted with artificial legs and progressed very well with these—walking normally, dancing, driving his car.

In a short time he was good enough to fly a fighter plane and was put back in action. Bader went on to become one of the highest-scoring English aces of the war (30 airplanes). In August, 1941, he was shot down over France and taken to a German prison hospital. The doctor who examined him was amazed to find he had no legs. Bader soon escaped from the hospital. Oh, by the way, when he bailed out of his Spitfire, his right leg came off. If it hadn't, Bader would have been critically hurt. Well, the Germans let the British parachute down a new leg! Anyway, Bader escaped but was recaptured by the Germans. Eventually he became enough of a problem for the Germans and he was transferred to Kolditz, a castle turned into a prison for "bad boys."

Bader was released at the end of the war. He was highly decorated during and after the war. He is classed as the best fighter-leader and tactician of WW II. But his greatest triumph was overcoming his handicap.

John Hill, Arvada, Colo.

Original design is fun

As an engineering student I must say I enjoy your magazine very much, probably because of the emphasis it places on original design. One certainly doesn't need a Ph.D. to design good model airplanes. A little wing theory, stability and balancing knowledge is about all it takes.

I never tried any original designs until I read "Straight and Level" in the Jan. '69 issue. Now I've got a free-flight Caudron "Simoun" half done and I don't think I'll

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S. W. LEE ET AL.

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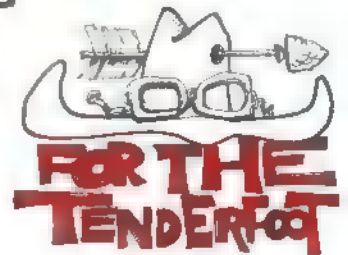
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Jim Michalak, Syracuse, N. Y.

Continued on page 80



Gentlemen, Start Your Engines!



Engine starting, operation, break-in, and trouble-shooting is a matter of technique and practice. Here's how an expert does it.

G. B. TELFAIR AND WILLIAM M. JOHNSON

GENTLEMEN, start your engines! Each Memorial Day this cry, echoing the Indianapolis Speedway, brings a score of racing power plants roaring into life the start of the Indy 500. But, on the model airplane flying field, such is often not the case. The Tenderfoot, who has just bought his shiny, new model airplane engine, having his difficulties getting it to run.

As frustration sets in, and the Tenderfoot and his Dad are about to decide that they're stuck with a lemon, an Old Modeler enters the picture. The Old Modeler goes through

a few motions, flips the propeller a couple of times, and the previously obstinate engine leaps into life and purrs like a kitten. "Now, what did he do that I didn't?" wails the Tenderfoot.

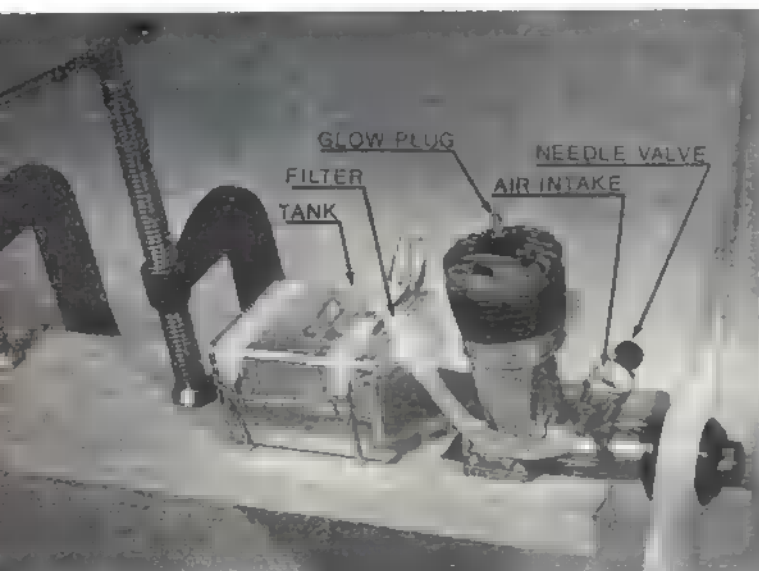
In this article, we'll try to give you the answers to his question. Any experienced modeler can tell you that there's no real difficulty in operating a model airplane engine. You just have to attend to details. Properly cared for, all modern sport-type engines will start easily and consistently, will run smoothly, and will have a

long and satisfactory life. So, to get started properly, study the accompanying photographs as well as this article. We've based the photos on a popular sport-type engine. However, the principles are applicable to all conventional model airplane engines.

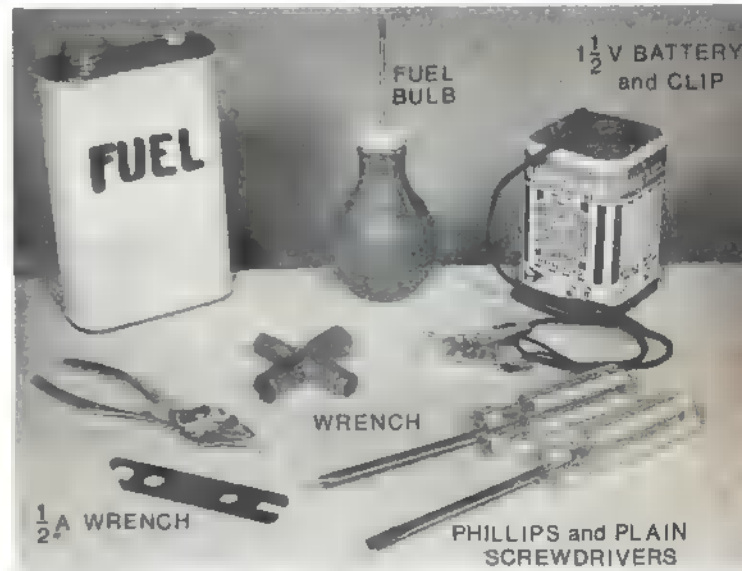
In addition to the how-to-get-started photos, we've included ideas on what to do if the engine seems not to want to start. And we've included a few pointers on operation to assure a long and useful engine life.

If you have a new engine, remember that all engines require careful break-in if they are to continue to give reliable operation. So, please be familiar with the section "Breaking in the New Engine" before you set out to start it for the first time. Take it easy, don't overspeed it! There'll be time, later, to demonstrate its high performance.

A few starting pointers: Priming causes most beginners to stumble. A couple of turns of the prop with the air inlet choked, plus a few drops of fuel in the exhaust port is usually all that is necessary. Some en-



With engine mounted on a board clamped to an outdoor bench, practice starting and adjusting it before mounting it in a plane.



Use fresh sport fuel, new battery, clean glow-plug clip, and have all the tools for your engine. The wrench is by Austin Craft.

gines may require only the initial choking, while others may require a juicy exhaust prime. You will need to become familiar with your particular engine.

When you start flipping the propeller and hear a mild "pop" every flip or so, the engine is trying to start. ■ keep cranking! A new engine can be stubborn and may require quite a bit of cranking before finally catching. So don't be discouraged if it doesn't fire right away. Many perfectly good engines have been returned to hobby shops because their inexperienced owners did not recognize this trait.

The experienced modeler's trick — to tell when the engine is ready to fire — is ■ useful one. Don't worry about the propeller being pulled out of your hand; the explosion force isn't that powerful if you have ■ firm grip on the blade. When you feel the light "catch," a few flips should have the engine off and running.

When your engine starts it probably will run roughly, emitting much blue smoke and raw fuel. That's because the needle valve is set too far open (too rich). Close the needle valve slowly (rotate clockwise) and the engine will start to run smoothly. Disconnect the glow-plug clip. If the engine slows, the mixture is still too rich, so reattach the clip and close the needle valve a touch more until the engine runs smoothly with the glow-plug clip removed. As you close the needle valve further, the engine will speed up and reach a "peak." Beyond this peak, as the needle valve is closed further, the engine will slow again as the mixture becomes too lean.

Don't run the engine at these over-lean settings, because it will overheat and damage itself. A well-broken-in engine runs best at a needle-valve setting about one-half turn richer than the setting for peak rpm on the ground. In flight, the air stream will provide enough extra air to lean the engine out to about its maximum speed.

When it won't start! No matter how carefully you have prepared, the time will come when you crank, and crank, and crank, and nothing happens. While you're resting your tired arm, check a few common ■■■■:

■ Are the battery wires loose, ■ the battery or at the glow-plug clip? Is the battery run down?

■ Are the glow-plug clip contacts clean? Dirt there can prevent the current from flowing.

■ Is the fuel line kinked so the fuel won't flow? Soft rubber tubing often does this. Is the line loose from the engine or from the fuel tank? Has the fuel line contacted the hot cylinder and burned a small hole in the tubing wall?

■ Is the propeller positioned correctly? Is the propeller secure on the shaft?

■ Are you using the propeller recommended in the engine instructions?

An over-large propeller can be too heavy for the engine ■ swing. If your starting preparations and these points show up O.K., then it's time for serious trouble-shooting.

Needle valve set too lean: A quick, screaming burst, followed by a sudden stop means that not enough fuel is reaching the engine. All it's doing is using up the priming fuel. ■ the fuel line isn't kinked or loose, open the needle valve another turn and try again after repriming. We've found a few individual engines that used needle-valve settings quite different from the manufacturer's recommendations.

Dirt in the fuel supply: ■ the engine still runs out the prime and quits, check for dirt clogging the fuel line ■ the needle valve. If you're using transparent fuel line, inspect it carefully for specks of dirt inside, particularly where the tubing joins the needle valve.

These particles can come from several places. An over-aged fuel bulb may be starting to shed rubber crumbs into the fuel as you squirt it into the tank. If the fuel tank is an old one, it probably has dried fuel residue in it, which flakes off when the new fuel hits it. And dirt may have drifted into your fuel can. Reputable fuel ■■■■ manufacturers are carefully clean, but if you let the fuel can sit around with the cap off, dirt will get into it. Save yourself ■ great deal of trouble by using a filter between the fuel tank and the engine. Clean the filter after every flying session, being ■■■■ ful not to lose the little screen that's inside and is the heart of the filter.

Dirt can be flushed from the fuel line by squirting a little fuel through it with the fuel bulb. Or replace the line with new tubing. Then, remove the needle from the needle valve and attach the fuel bulb directly to the needle valve inlet. Squirt fuel through the valve to flush out any dirt.

To remove dirt from the fuel tank, remove the tank from the test block or the model and flush clean fuel through it. In

the ■■■■ of a small engine with an integral tank, carefully remove the tank, following the manufacturer's instructions, and flush it out with clean fuel. Just be careful that you don't introduce more dirt than you remove!

Loose parts: After several cycles of the heating and cooling to which a model engine is subjected, cylinder-head bolts and crankcase bolts and glow plugs become slightly loose. This looseness can cause the engine to leak enough to prevent starting. Tighten them up (with the correct screw-driver or wrench), including the engine-mount bolts, before and during each flying session.

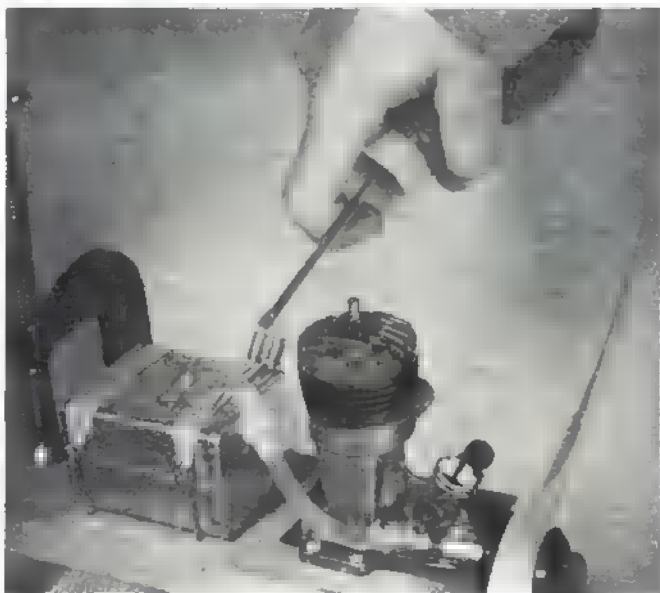
Glow plug troubles: If the engine shows ■ inclination to fire, either from the beginning, or after one of those screaming, too-lean bursts, first check the glow plug. It may have burned out or have been the victim of vibration. The easiest check is done by attaching the glow-plug clip and looking into the exhaust port with the piston down. An orange glow shows that the plug is O.K. If you're still not sure, remove the plug and place it across the jaws of the clip as shown in one of the photos. The plug element should light up (in bright daylight you may have to shade it to see the glow). If it doesn't glow, select a new plug, but test it before putting it in the engine. (Funny thing, the battery might have been dead all along, although new plugs have been known to be faulty!)

If the engine quits after the glow-plug clip has been removed, the plug may not be holding its glow in the heat of the combustion chamber. It may be just "tired" from over age or too much high-speed, high-temperature running. The only cure is a new plug.

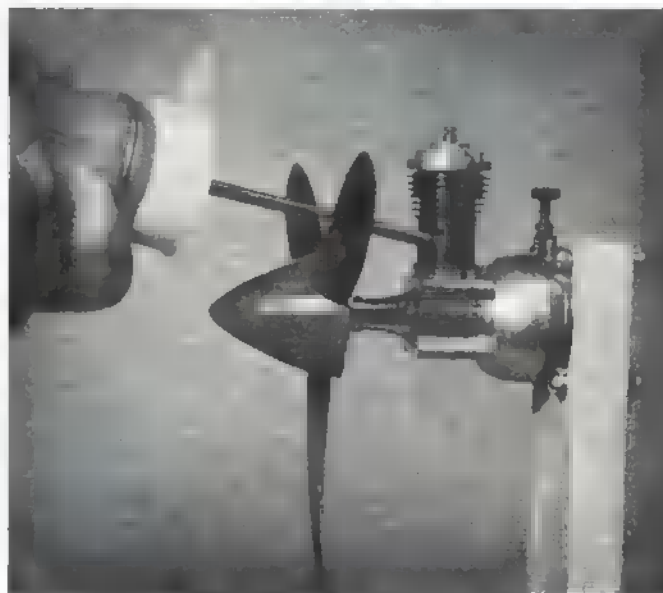
Sometimes the glow-plug element, through use, gets against the plug wall and causes a short circuit. If this appears ■ have happened, gently use a straight pin to pry the element away from the plug wall. This may restore the plug and save you 50c.

Always follow the engine manufacturer's recommendations for glow plugs. Small engines usually take short plugs; large engines usually use long plugs. A long plug in a small engine can interfere with the piston travel, at the least keeping the engine from starting and, at the worst, damaging the piston.

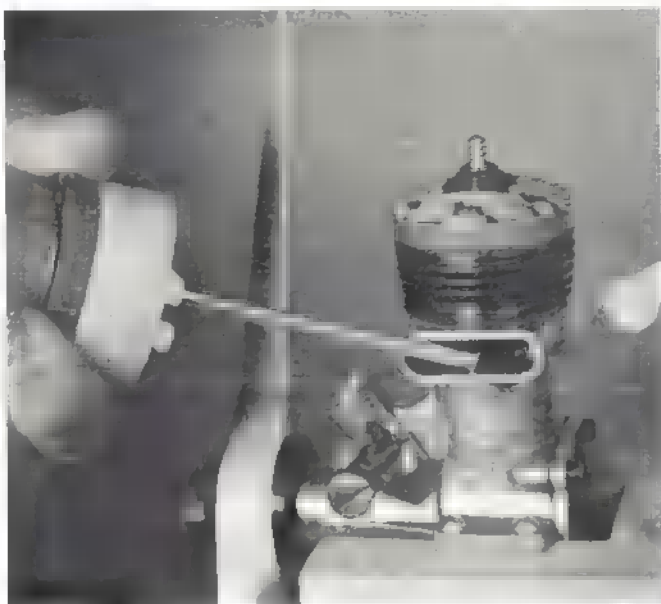
Flooding: Probably the most common



Tank size is chosen for convenience only, but note that the tank is about even horizontally with the engine's needle valve.



Bolt a radially mounted 49 engine to a sturdy piece of wood which is then clamped in the work-bench vice. Priming method shown.



When priming the larger engine, place the prop so that the piston is at its lowest position, squirt a few drops into the cylinder.



Choking the engine means closing the intake or carburetor opening with your finger, while holding and rotating the prop a full turn.

cause of starting difficulties is flooding. This means that there is so much raw fuel in the engine that the fuel-air mixture reaching the combustion chamber is much too rich. This mixture won't burn properly, and also tends to quench the glow plug. Flooding is caused by over-priming, a too-open setting of the needle valve, or both. It can usually be recognized by the raw fuel being thrown out the engine exhaust and being spit back through the air inlet when the propeller is flipped.

A light or moderate flooding condition often will clear itself by evaporation while you're checking the glow plug, fuel lines, etc. So, after making these preliminary checks, it's a good idea to try a start without any prime, on the chance that there's enough fuel remaining in the engine for a start.

A lightly flooded engine may emit one loud "bang" and stop when it is cranked. Invariably, the force of this backfire has

loosened the propeller. Remove the glow-plug clip, reposition the propeller, reattach the glow-plug clip, and try again. If the engine doesn't respond after a dozen flips, reprime and try again. If it still won't cooperate, check the glow plug; the force of the backfire may have damaged it.

Heavier flooding is best cured as follows:

- Disconnect the fuel line and close the needle valve.
- Connect the glow-plug clip.
- Crank until the engine starts. It will run roughly for a short burst and quit.
- Continue cranking until the engine fires again, runs longer, smoother, and then stops.

● Reconnect the fuel line, open the needle valve, and proceed to start as usual.

In cases of very heavy flooding, remove the glow plug and invert the engine, keeping the inlet low. Rotate the propeller by hand and fuel will flow out the various openings.

Loose needle valve: If the engine starts well, and runs for a while, and then starts to slow or run erratically, check the needle valve. It is probably loose. If the spring clip that retains the needle is not tight enough, the needle can vibrate open or closed. Sometimes the spray-bar, into which the needle valve screws, becomes loose in the air inlet and turns so that its spray hole no longer points down into the engine. Reposition and tighten these parts, making sure that the spray hole points directly down the air inlet.

Breaking in the new engine: If you are starting with a brand-new engine, don't try to get top rpm's from it until it has had a chance to break in. All you'll accomplish will be overheating and damage to the engine. This damage will not show up right away, but it will show up, eventually, in drastically reduced engine life.

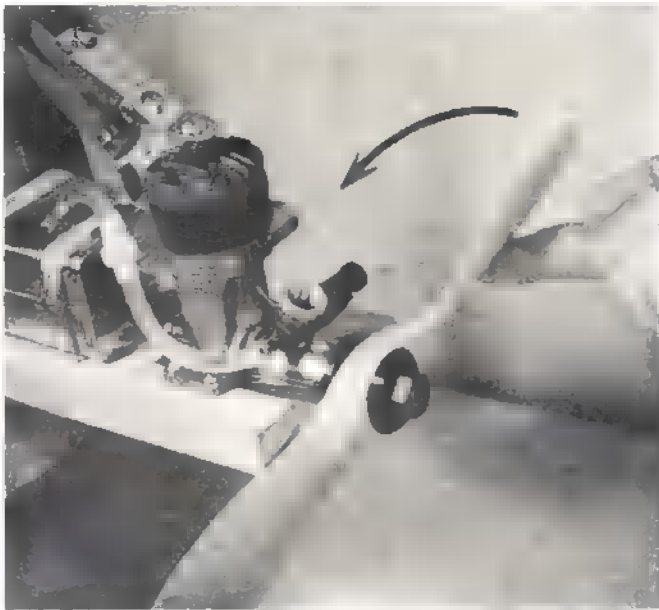
There's no trick to breaking in a model engine. Just run it at a relatively low



Opening the needle valve will run your new engine slower with a rich mixture. It will run cooler and have more lubrication.



Engines do backfire and fingers can get cut. A simple inner-tube rubber finger guard is easy to make. Use it on all sizes of engines.



Set the needle valve per article, then clip and flip. With finger behind prop, pull across forcefully as quickly as possible each time.



With engine running, adjust needle valve. To run faster turn valve clockwise. This leans the mixture by reducing the fuel flow.

speed for several tanks of mild fuel, letting it cool between each run. The first two or three runs should be only about 30 to 60 seconds. Then, work up through a few runs to full tankfuls. Control-line modelers often put a new engine in a trainer after the first couple of test-stand runs, and complete the break-in program with a rich mixture in flight. The airflow around the engine keeps it from overheating. As before, let the engine cool between runs.

As the break-in progresses, the engine performance gradually improves, the running characteristics become smoother and smoother, and the engine becomes easier to start. You can tell if your engine is properly broken in by practice-flipping the propeller against the engine compression. If the propeller bounces back, nice and springy, the engine is broken in properly.

Operating tips: This may sound like a broken record, but treat your engine right and it'll treat you right. It never hurts an

engine to be run slightly rich. On the other hand, it can be quickly ruined by overheating from flight after flight at high speeds with an over-lean mixture. Don't be fooled by the way engines operated in Speed, Rat-Race, Combat, Navy Carrier events. The contestants are demanding the most the engine can give and expect a relatively short life.

In Sunday flying, though, there's no need to beat the engine to pieces. Remember, when the model is in flight, the engine receives more than it does on the ground, so it's leaner. Therefore, set the needle valve about one-half turn richer than the setting for peak speed on the ground, and it won't over-lean in the air.

We shouldn't have to mention it, but every modeler often tries to fly with a nicked or split wooden propeller. For safety's sake, don't! The prop is likely to fly apart. Aside from pieces of wood flying like bullets, the brief, violent vibration that oc-

curs before the engine stops has been known to rip the engine right out of the model.

Nylon propellers are popular because of their durability. However, if the tips become frayed, they should be trimmed and the propeller rebalanced. Otherwise, the unbalance will rapidly wear the crankshaft bearing.

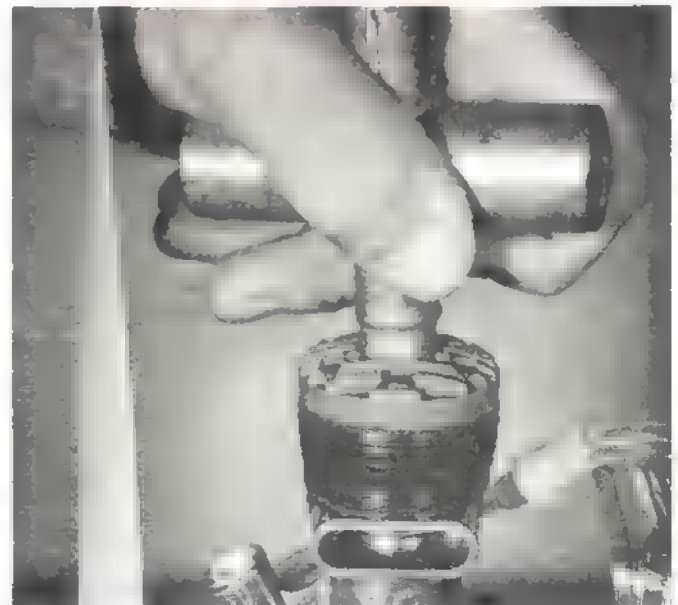
If you use a "chicken stick" (a short, rubber-padded wooden stick), don't bat at the propeller with it to start the engine. The blow will damage the propeller.

If the propeller nut becomes stiff to turn, and you have trouble removing it (the result of rust threading or crash damage), insert a hardwood stick or a broken propeller blade through the exhaust port into the combustion chamber to hold the piston and crankshaft while the nut is turned. Don't use a screwdriver for this; it will damage the piston and cylinder liner.

Continued on page 80



Check the plug if the engine won't start. If it lights up, then both the battery and plug are good, but if not, check the battery.



Try new plug only if your battery is good. Always use wrench when installing plug in tightening prop nut. Just get plug snug.

For 40 years, this plane has offered to the amateur unequalled simplicity, ruggedness,

Pietenpol

PETER M. BOWERS

Drawings by Robert Parks

ONE of the big surprises of the amateur-built airplane movement is the sudden popularity of the ancient Pietenpol Air Camper. Since this is a relatively crude and low-performance airplane dating from 1928, there must be a reason for it. Perhaps it's just the modern builders' rebellion against the current trend toward more power, higher performance, more complex structures, and, of course, more cost that is taking place in the homebuilt field as well as in the rest of the general aviation activity. Certainly, the Pietenpol reverses this trend and goes as far in the other direction as possible while still being capable of flight.

The Air Camper was the brain-child of Mr. Bernard Pietenpol of Spring Valley, Minn. The prototype was started in 1928, a time before the new federal regulations began to catch up with the little guys who wanted to design, build, and fly their own airplanes. In spite of the increasing severity of the rules, the Air Camper design caught

on. Plans were published in installments by *Modern Mechanics* magazine in 1930 and appeared all together in the 1931 issue of the famous *Flying and Glider Manual* published as an annual by the same organization (this has since been reprinted by EAA, the old plans are available to new builders).

Costs were kept to a minimum by using commercial grades of wood, a converted Model-A Ford automobile engine that produced approximately 40 hp, and quite a bit of cheap World War I surplus hardware that was still available at the time. Another appealing feature of the Air Camper was the fact that it was a two-seater, something rare among the few available amateur designs of the day.

The design is what is known as a parasol, with the wing above the fuselage. This was built in one piece, with the spars spliced in the center. The spars were lightened somewhat by routing them to an I-section on a table saw. The airfoil section was a Pietenpol original design closely resembling the U.S.A.-27 section dating from WW-I.

While performance is extremely marginal by present-day standards, it must be realized that the owners' requirements for a homebuilt airplane in the early 1930's were considerably different from what they are today. Miles per hour, rate of climb, and aerobatic capability were not important then. The big thing was just to get off the ground and fly around the countryside in a plane that would hold together and get back down in one piece. Remember, these were the depression years. Major aircraft firms were folding up all over, most of the would-be amateur flyers could afford steel tubing or the new light airplane engines that were just then coming on the market, and few could afford flying lessons. The Pietenpol, therefore, was a workable answer to a lot of dreams. The raw materials were cheap,



Author's plane is all-original Pietenpol except new parts substituted for safety reasons. Engine is the Funk Model E, a special aircraft conversion of the Ford Model A.



Water-cooled engine has radiator in front of pilot. As long as radiator doesn't leak, it

low cost, and docile performance.

Air Camper

anyone who was good at tinkering could make the simple Pietenpol-developed conversion of the Model-A, and the airplane itself was certainly simple to build. In fact, nothing developed in the following 40 years has been able to match the old Air Camper's combination of simplicity, ruggedness, low cost, and docile performance.

While many of the Air Campers built in those early days did get publicized in the pages of *Modern Mechanics* and the old *Popular Aviation* (now *Flying Magazine*) which also boosted amateur aviation, many did not, which is just as well. As mentioned, many of the amateur builders could not afford flying lessons. With lots of open space and few nosey inspectors in those days, many builders of Pietenpols also taught themselves to fly in them. This naturally led to a lot of accidents that one heard about, but it is a tribute to the sound aerodynamics of the Air Camper that so many were able to go this route successfully.

When amateur-built airplanes were finally recognized by the federal government in 1947 and granted legal status, a number of the surviving Air Campers of the 1930's came out of storage, were refurbished, and proudly took to the air again with the new Amateur-Built airworthiness certificates in the Experimental category. At first, however, they drew little attention. The home-

built movement didn't really get rolling until the early 1950's, and the handful of Air Campers regarded more as restored antiques than the equals of the new crop of amateur designs then putting in an appearance. ■ anything, they were regarded with some derision: "The guy fixed up that old clunk because he couldn't afford the materials for a new one."

That attitude didn't prevail for long. By the late 1950's, ■ new Pietenpols began ■ appear. A few were built by purists who were willing to accept the limited performance of the Ford-powered original for the satisfaction of flying a genuine American classic. They weren't out for speed, performance, or transportation; all they wanted was a piece of sporting goods—something to have some simple fun in.

However, some of the latter-day builders, trained to different standards, accepted the Pietenpol concept of simplicity and low cost but wanted a little more performance than the Air Camper was intended to deliver. These people made little "improvements" here and there; trying to perk up what they thought ■ pretty feeble aileron effectiveness by adding wing-tip plates, changing wing-tip and tail shapes to express their own individuality, substituting a "better" airfoil like the Clark Y (which dates from 1922) for the original Pietenpol, and seeking better climb and speed by using modern 65 hp flat-four aircooled airplane engines. While the wing and tail changes accomplished practically nothing, many of the engine changes introduced serious new problems.

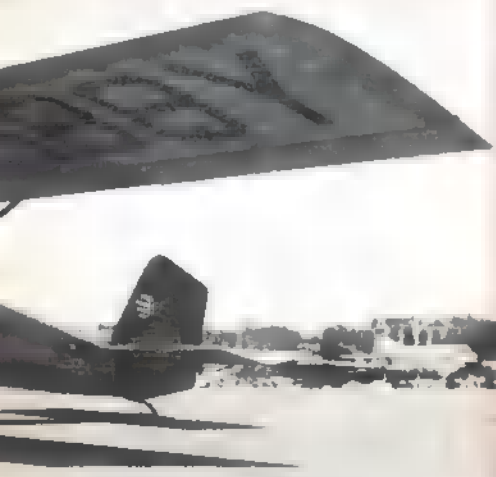
The main ■ was that modern engines were considerably lighter than the old cast-iron Ford engine and radiator combination, with the result that the "improved" airplane becomes very tail heavy. This can be corrected in ■ of two ways: by adding ballast to the nose, ■ by moving the lighter engine forward to restore the balance. The latter course is undesirable for a number of reasons. First, the longer nose considerably alters the lines of the airplane. Second, the longer nose, coupled with an already short tail, increases the tendency of the gyroscopic action of the propeller to make the nose swing ■ takeoff. One recent builder of a long-nose Air Camper had so much trouble from this that, in desperation, he converted his ship to tricycle landing gear!

Most of those who altered the original Pietenpol design ■ found out that it is hard to make only one major change to an airplane—several other things have to be changed to accommodate the first change. Some changes are relatively simple, however, and cannot be regarded ■ tampering with the design. Since the original Pietenpols flew from grass strips, they were equipped with tailskids. With most modern sport flying being done from paved runways, steerable tail wheels, and ■ brakes on the main wheels, have become mandatory. The purists who stick to tailskids and brakeless wheels know enough to operate only from the grass.

While some of the Pietenpols with modern engines have been relatively successful, the lessons learned from the less successful have begun to sink into other builders and a higher percentage of "pure" Air Campers with Ford engines are now beginning to appear. The cheap stigma has been completely removed from the old design and it is now more popular than ever. Even Bernard Pietenpol has built another to use as a test bed for his experiments with an aircraft version of the Chevrolet Corvair engine.

While the difference between the 40-hp of the Model-A and ■ modern 65-hp Continental may seem considerable, the modern builders don't realize that old-fashioned and modern horsepower aren't the same. The Continental has a displacement of 170 cu. in. and delivers its 65 hp to ■ 74-in. propeller at 2300 rpm. The Model-A, however, has 200 cu. in. and delivers its so-called 40 hp through a 76-to-78-inch prop at 1800 rpm. In actual pounds of thrust, the two

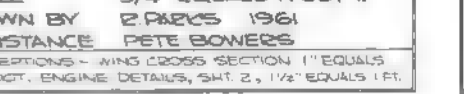
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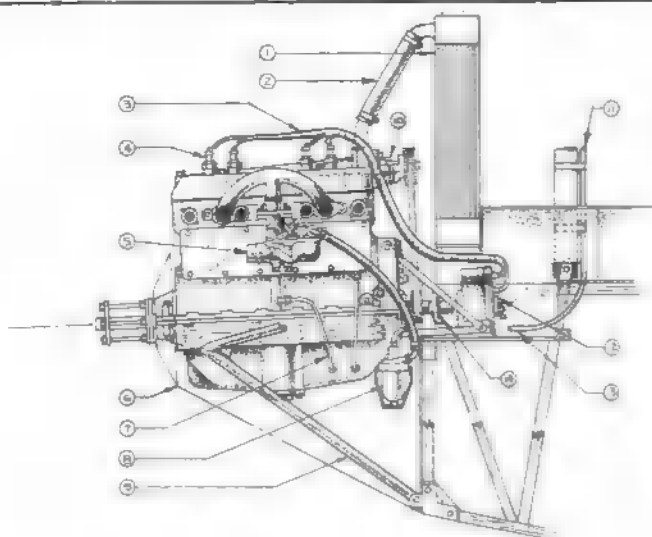


provides warmed air for pilot's face ■ ■ chilly day. Engine gives 62 hp at 2200 rpm.



Author holds hinged wing section which allows easier entry into rear cockpit. For lack of old-style clincher tires, modern motorcycle wheels and tires, with covered spokes, are used.



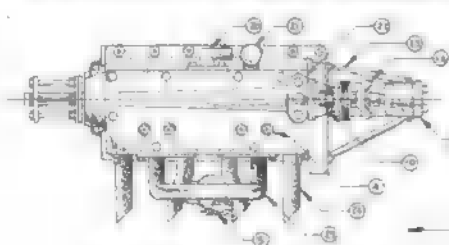
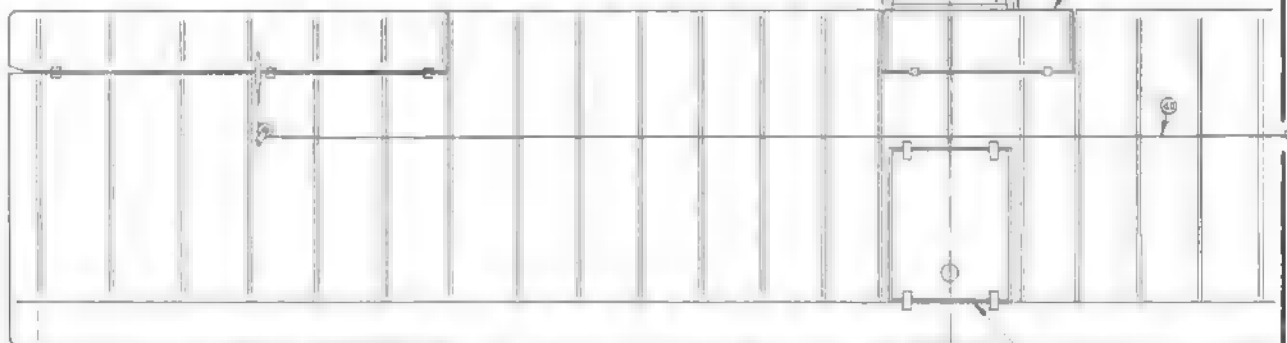


- 1 WWII WAR SURPLUS RADIATOR
- 2 UPPER WATER HOSE
- 3 IGNITION WAGNESS
- 4 AUTOMOBILE TYPE PLUGS
- 5 MODEL-A FORD CARBURETOR
- 6 ALUMINUM COYL OUTLINE
- 7 REROUTED OIL LINES
- 8 FUEL FILTER BOWL
- 9 TUBULAR MOTOR BEAM SUPT
- 10 REMWORKED WATER PUMP

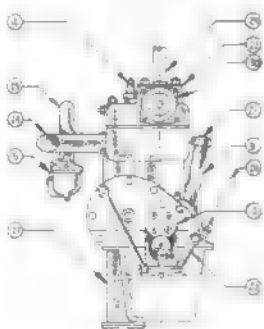
- 11 BRACE WIRES
- 12 ELEVATOR CABLE
- 13 RUDDER CABLE
- 14 REAR SEAT
- 15 REAR SEAT ENTRY FLAP

SCALE IN INCHES 1 FEET

SHOWN ABOVE IS THE CONVERTED FORD MODEL-A ENGINE INSTALLATION MOST COMMONLY USED IN THE PIETENPOL AIR CAMPER. WAR SURPLUS AUTOMOBILE ENGINES WERE USED; FORD MODEL-A, CHEVROLET OVERHEAD VALVE '4; & THE MODEL-A. THE MODEL-A WAS CHOSEN FOR ITS POWER, RELIABILITY, LOW COST & PARTS AVAILABILITY. ENGINE MODIFICATIONS FOR THE AIRCRAFT CONVERSION WERE RELATIVELY SIMPLE. REMOVED WERE OIL PAN BAFFLES, OIL LINES FROM PUMP, OIL PASSAGES, SHIRT SEAL, WATER PUMP PULLEY MOUNT, CARBURETOR, INTAKE MANIFOLD, MAGNETO NEW, & OIL FILLER PIPE.

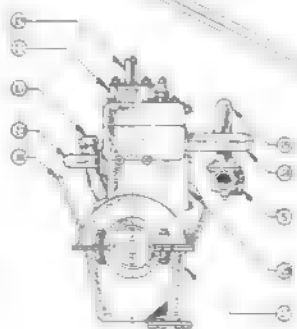


- 1 WATER CONNECTION FROM RADIATOR
- 2 OIL FILLER CAP
- 3 WATER PUMP HOUSING
- 4 MAGNETO MOUNT
- 5 EXHAUST STACK
- 6 INTAKE MANIFOLD
- 7 OIL DIP STICK
- 8 OIL DRAIN HOUSING
- 9 VALVE COVER PLUG NEW
- 10 NOTE: ENGINE PLAYS VERY ST
- 11 LEFT AND REAR & FRONT IN
- 12 BELOW ARE DESIGN TO SAME
- 13 SCALE 1/2 INCHES 1 FEET



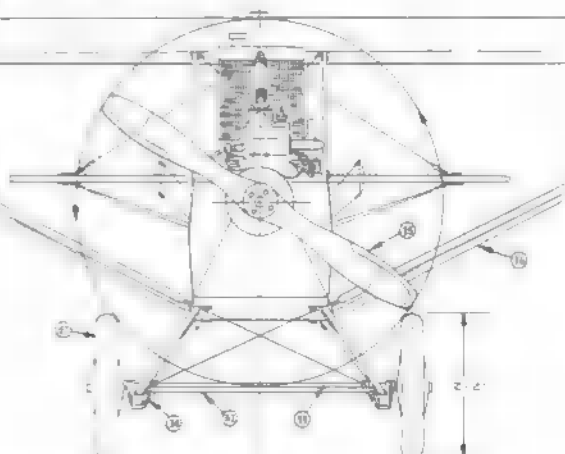
REAR VIEW

- 1 RADIATOR HOSE CONNECTION
- 2 WATER PUMP PULLEY
- 3 OIL FILLER PIPE
- 4 STEEL TUBE SPREADER BAR
- 5 STEEL TUBE AXLE
- 6 BUNSEE SHOCK CORDS

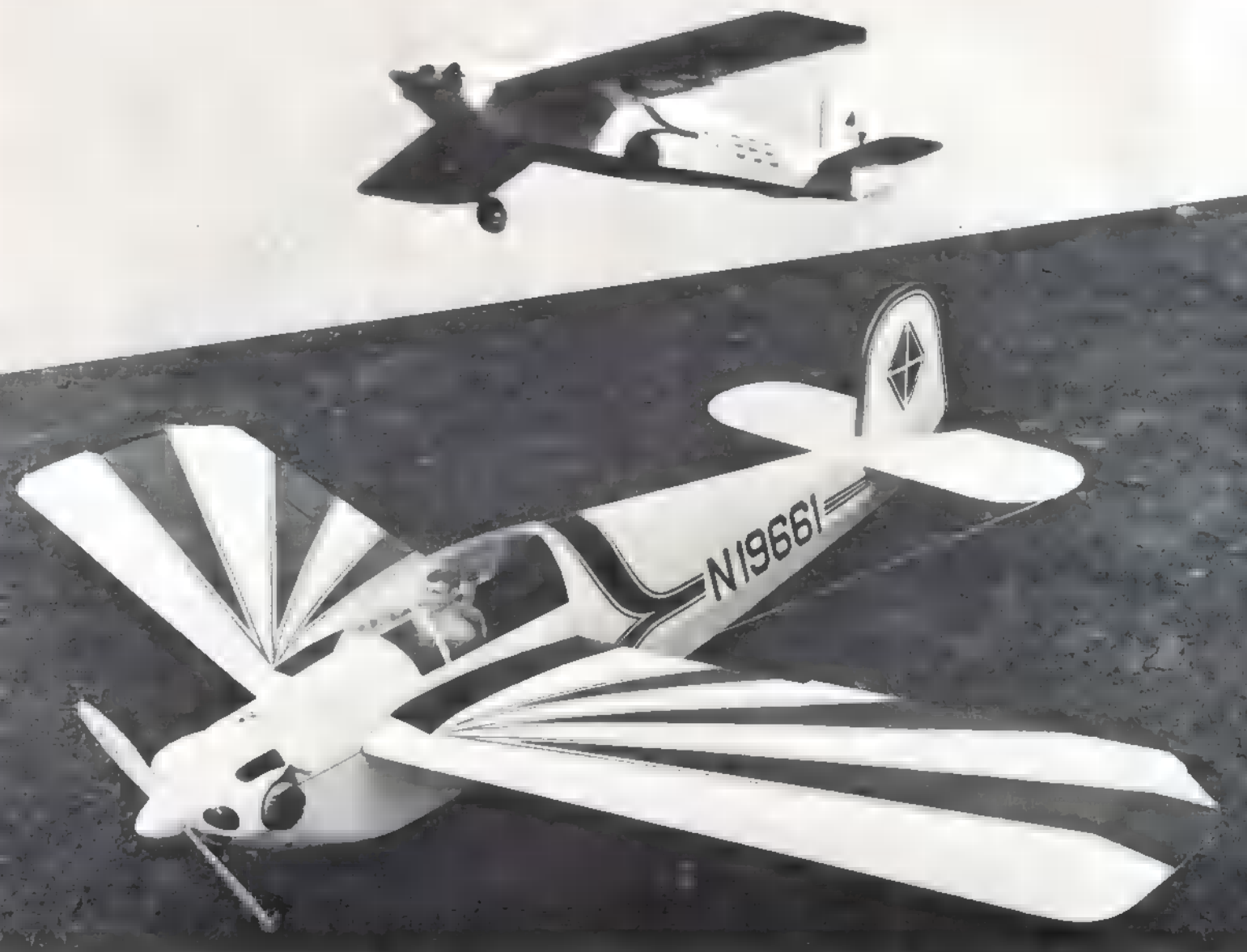


FRONT VIEW

- 1 WWII WAR SURPLUS WARENCE'S PROO
- 2 STREAM-LINED STEEL TUBE STRUCT
- 3 WAR SURPLUS WHEELS
- 4 HOME MADE GAS TANK
- 5 OLD ALUMINUM COVERED LEADING EDGE
- 6 ALERON CABLE



PIETENPOL AIR CAMPER
SHEET 2 OF 2

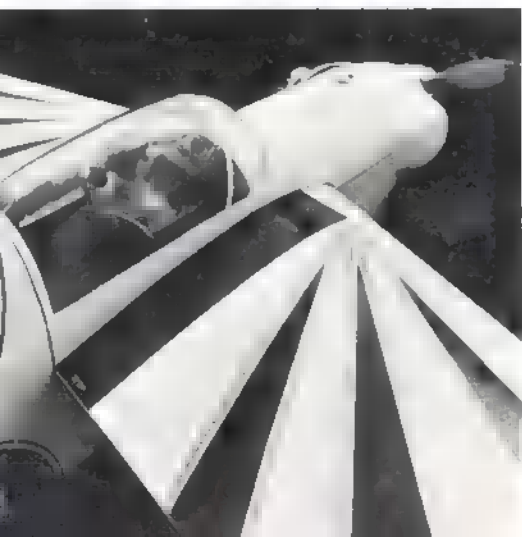


If you envisioned a monoplane version of the great Jungmann biplane would it be like this? Swept wing helps with perfect tracking through stunts and permits easier, slow landing approaches.

JUNGSTER

Two-inch Williams "Sportsman" pilot fits under home-made canopy. Burnished aluminum panel with Tatone instruments.

Wing has no dihedral because the swept wing supplies adequate lateral stability. Also permits easier wing construction on flat working board. Knife-edge flight should actually climb with all this side area and large rudder. Main gear is wing mounted as on low-wingers.



An aerobatic model designed to look and fly like a full-scale plane. Article describes unusual cowl and canopy molding methods.

GERALD C. LEAKE

WHAT the heck is a Jungster? It's a Jungmann gone single-wing, and modernized. It's simple and fast to build, and resembles a modern homebuilt aircraft.

My scale Jungmann had such good flying characteristics, I decided to build a single-wing version for aerobatic competition and Sunday flying. Coincidentally, the nose and tail moments are the same as a Kwik-Fli. The Jungster goes together quickly and cheaply since the fuselage is just a bundle of sticks with no carving of big, expensive blocks of balsa. And it's rugged.

The entire plane was built in ~~one~~ week. Only the fiberglass cowl took time. The mold took 24 hours to set up; the cowl molding within the mold only about two hours. Covering takes a couple of nights, and painting a week.

Out to the field we go with our 720-sq. in. Enya 60-powered, 6½ lb., true-scale Jungster. It does every maneuver in the book with the greatest of ease, and it looks splendid. I've had any number of people come up and say, "What's it a scale model of?"

Fuselage construction is the same as building a rubber-powered model. It's a stick box with sheet balsa in front, and sticks in the back. Build two identical sides. Epoxy the plywood bulkheads and firewall vertically to one fuselage side and then epoxy the other fuselage side to the top of the bulkheads. Make sure all bulkheads are vertical to the sides. Let dry, pull the tail together and epoxy. Then epoxy in the sticks to complete the fuselage box. Make sure it's straight before the epoxy is dry.

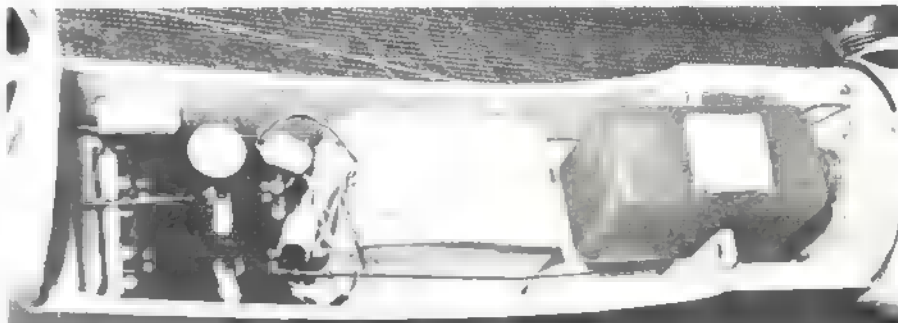
Glue on the formers for the turtle-deck structure and add the stringers. Sheet the forward bottom half of the fuselage, add fairing strips where indicated, and the basic fuselage is completed. It takes about two nights to build.

Build the wing and tail feathers next. The tail is sanded to shape after all the ¼" sticks are dry. The wing is built conventionally except that it is best built upside down and as one piece. It also can be built as two pieces, joined. It has no dihedral (13 degrees of sweep); therefore, it can be built flat on the work bench. The spars and center section ¼" balsa splice can be built before the ribs are glued in place.

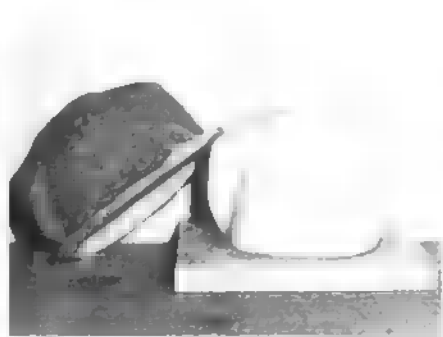
The ailerons are cut out after the wing is constructed. Position triangular jigs even with trailing edge of the wing. Lay the trailing edge sheets flat on the jigs. Lay down the main spar assembly and glue down all the ribs. Glue the top spar in place. Add leading edge, aileron spar, and vertical webs between ribs and through spar structure center section.

Sheet top of wing. Let dry and sheet bottom of wing. Don't forget to poke pin holes through the wood to mark where you should cut out the ailerons before you sheet the top trailing edge. Also, epoxy in the aileron horns before the trailing edge is sheeted. Add the bellcranks, rods, and wing tips. The servo hole can be cut out after the wing is covered. The wing and tail feathers can be built in two nights.

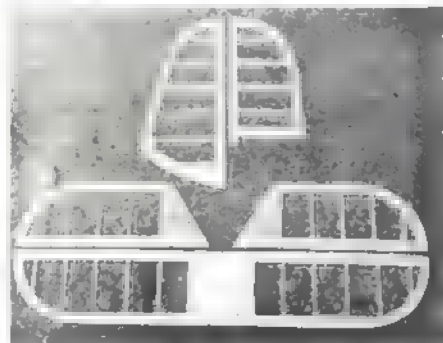
To build the fuselage canopy-hatch, cut out the ¼" hatch sides; glue the formers in



Virtually any control system will fit in this cavern! With swept wing, radio must be as far aft in fuselage as practical. Holes in bulkhead beside tank are for wing-mount dowels.



New method for making fiberglass cowls. Latex rubber mold is made over pine plug, then glass cowls are made in rubber mold.

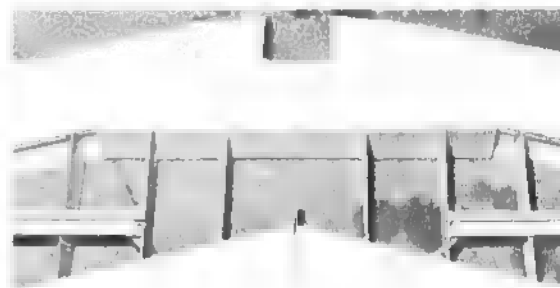


Built-up tail surfaces are light and sturdy. Generous control surface areas give powerful control responses. Great for spins.

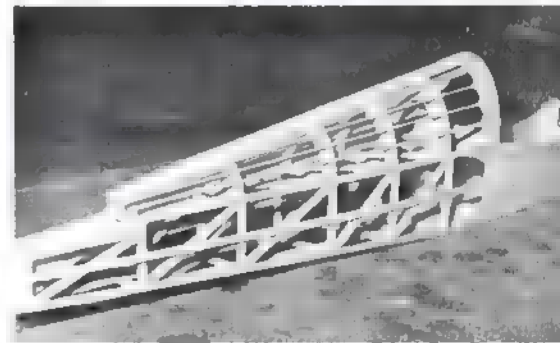
place and let dry. While the hatch is drying, shape a mold for the canopy out of pine or poplar. Allow ~~one~~ at least a half inch extra on bottom of the mold.

Sand the hatch sides to match formers and sheet the top of the hatch. Add the ¼" block to the back of the hatch. Add the ¼" sheet in the cockpit area. Now, epoxy finish your canopy mold. Don't use dope ~~as~~ it will blister when the hot acetate is drawn over it, and remember, the canopy is only as good ~~as~~ your finish. After the hatch is dry, put the wing on the fuselage and carefully align it so it is square. Put the hatch on top and trim ~~as~~ necessary to get a good close fit. Hold the hatch in place and drill a ¼" hole through the hatch, wing, and wing hold-down block on the fuselage.

A ¼" blind nut can then be inserted in the bottom of the hold-down block. The hatch acts as a clamp to hold the wing in place; therefore, ~~one~~ special beefing up of the trailing edge of the wing is required. A nylon ¼" screw works great to hold the wing and hatch in place. The forward part



Joining wing halves requires no dihedral braces as such; rather, a special built-up box holds sheeting and spars together.

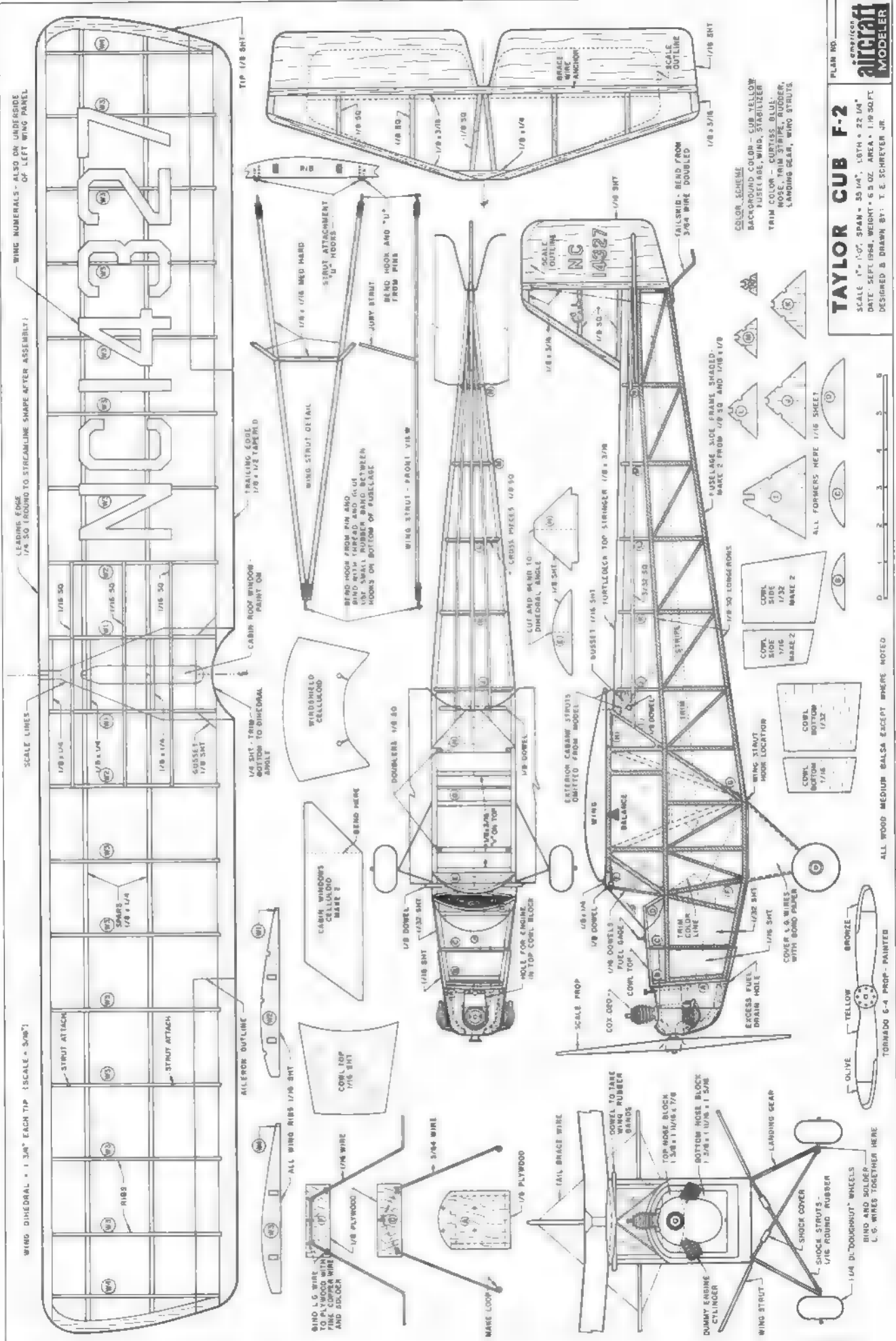


Fuselage is made up of sticks of ½" square balsa as with a rubber-powered free-flight. Formers, stringers, and doublers are added.

of the hatch is drilled with a ⅛" drill clear through into the top edge of the firewall. The firewall is then tapped with a 4-40 thread. Don't forget to put a plywood insert in the screw hold-down area at the front of the hatch and over the wing hold-down screw hole at the back of the hatch.

The canopy can now be formed. First build a vacuum box. Build an open top box a little bigger than the length and width of the canopy and about 2 to 3" deep. Bore a hole in one end of the box, just the size to press a vacuum cleaner hose into. Be sure it's a close and tight fit. Fasten the canopy mold to a sheet of peg board (with wood screws from underneath), the size of the box and seal the top to the box. Make a frame from ½ x 1" lumber that has the same dimensions as the box top. A vacuum box is now completed. Air tightness is not critical, but the box should be glued and nailed.

Forming the canopy is easy despite its size. Fasten a sheet of .030" butyrate acetate to the bottom of the frame with staples.



PLAN NO. **Taylor Cub F-2**
 SCALE 1" = 1'-0", SPAN = 35 1/4", LETH = 22 1/4"
 DATE: SEPT 1948, WEIGHT = 6.5 OZ. AREA = 1.19 SQ. FT.
 DESIGNED & DRAWN BY: T. E. SCHREYER JR.



The original Taylor Cub with short windshield, exposed cabane struts, and open cockpit. Design developed into closed-cockpit Model F-2.

Taylor Cub F-2

This .02-powered model is just like the real plane — which Taylor Aircraft described in 1931 as soundly engineered, sturdy, safe and economical to own and fly.

TED SCHREYER

COMBINE the finesse of a rubber-powered scale model with the excitement of gas-powered free-flight and you come up with the "mini-power" scale model. The Taylor "Cub" F-2 is such a model. With a 35" span it is easy and economical to construct. The little Cox .020 Pee Wee engine puts out just the right amount of thrust to provide beautiful, realistic flights, sure to make an afternoon of flying pleasure.

Why was the Cub chosen for a free-flight scale model? Well, it provides a simple and stable design which, with its airframe of straight lines and flat surfaces, makes for easy building and covering. It also makes a very attractive model of one of the interesting and most important lightplanes in aviation history.

The plan was drawn to a scale of 1" = 1' from a 3-view drawing in "Flying for 1936" — published by The Aeronautical Chamber of Commerce of America, Inc. — with an assist from data and photo courtesy of the Piper Aircraft Corp. Wing dihedral and tail surface areas were increased to improve flight performance. This Cub model is a practical flying scale design, not a super-detailed exhibition piece.

The Taylor Aircraft Co. of Bradford, Penn., produced this lightplane in 1931 that, in their words "... must look and perform like the larger, expensive planes; must be soundly engineered, sturdy and tough ... and it must be safe. Above all, it must be economical to own and fly." The resulting success of this plane, and the later Piper Cub designs, is legend. Construction was strong and long-lasting, with wing of aluminum-alloy ribs and spruce spars; fuse-

lage of welded, tubular steel; tail assembly of tubular steel; and the plane fabric-covered except for the metal engine cowl.

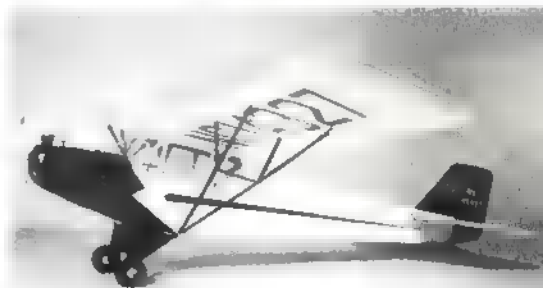
The F-2 was powered with a three-cylinder Aeromarine AR3-40 engine of 37 hp. had a cruising speed of 110 mph, a gross weight of 1100 lbs., span of 35'-3", length of 32'-3". It seated pilot and passenger in tandem, and cost \$1540 with enclosed cabin. The same Cub airframe was fitted with a Continental A40-2 four-cylinder opposed engine of 37 hp and called the E-2.

Construction: Study the plan to familiarize yourself with the model. When buying your supplies choose the wood carefully, since a few minutes spent selecting good balsa will make your model easier to build, last longer, and fly better. Soft balsa lacks strength, while rock-hard balsa is too heavy. This model is on the sturdy side to withstand the rigors of everyday flying, which also makes it easier to build because of large wood pieces. Give all joints a second coat of glue for strength.

Fuselage: Make two sides, one at a time, over Saran-wrap protected plan. The fuselage side is shown shaded. Longerons and uprights are 1/8" sq. balsa, while most diagonals are 1/16" x 1/8" balsa. Make cuts in the longeron where it changes direction, and glue. When a side is dry, remove from plan and add the 1/8" sq. cabin doublers, extending from fuselage top to bottom. Bevel inside rear of sides and glue together. Cut the cross pieces to length from the top view and glue in place, working from tail to nose. Check often to keep fuselage sections rectangular and fuselage longitudinally straight. Glue plywood firewall "A" to fuselage front, then glue in place balsa formers "B" thru "N."



Caught at its usual slow gliding pace, model has generous areas for good stability.



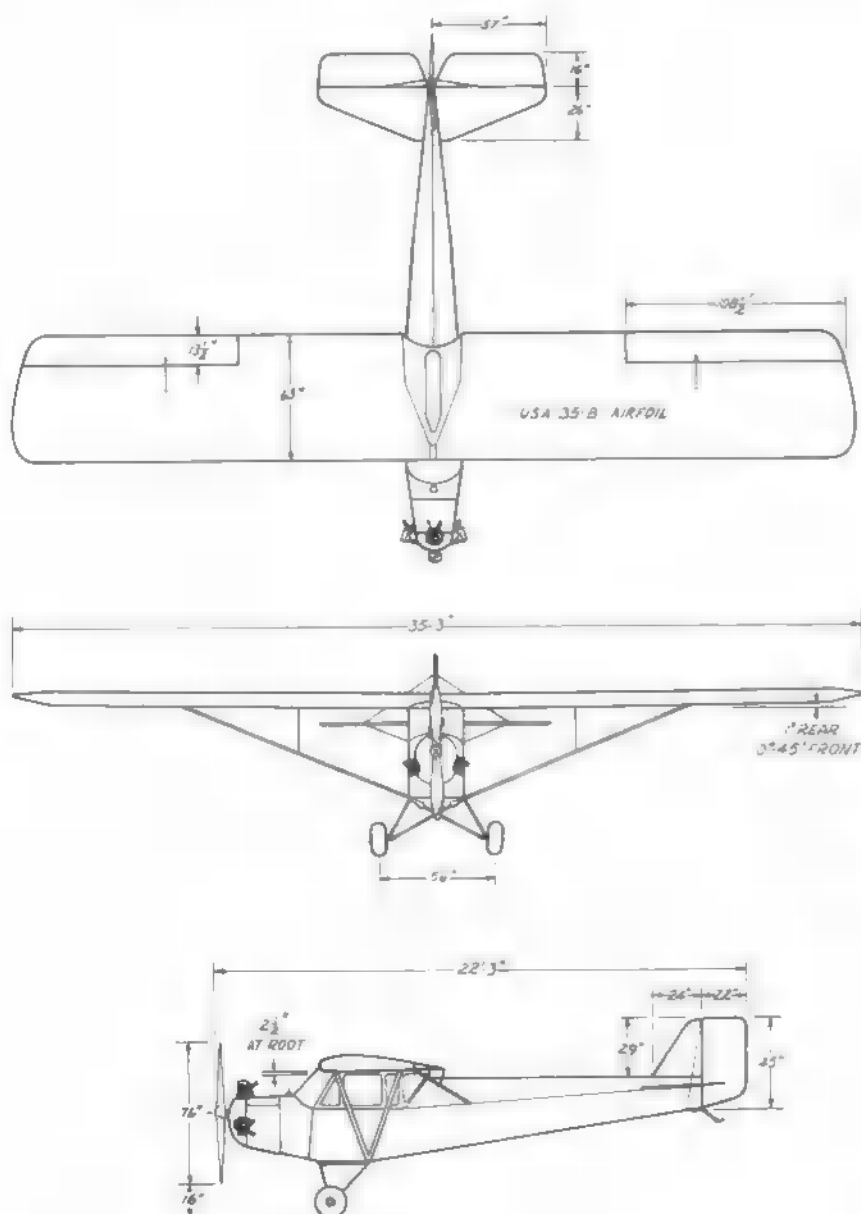
Model engine simulates top cylinder of the Aeromarine 3-cylinder engine used on F-2's.



Among the greatest joys of modeling is flying small, near-scale free-flight models. Flying the real plane was much the same; you flew for the sheer enjoyment of it.



Struts are non-functional and may be removed for flying. Wing is removable for crash protection and easy carrying. Scale-like wheels are available from Williams Bros.



TAYLOR AIRCRAFT COMPANY
Bradford, Pa.
TAYLOR CUB F-2 — 2 PLACE
ENGINE: AEROMARINE AR3-40

Bend the two landing gear wires to shape, attach to their bulkheads, and glue in place. Then bind and solder l.g. wires together near axle. The cabin roof is slightly V-shaped to fit wing underside. Top and side turtledeck stringers can be glued in place, but leave free at tail until stabilizer is added later. Add the dowel gussets and the $\frac{1}{8}$ dowels for wing hold-down, and the $\frac{1}{16}$ dowel struts. Make the cabin top-front strong.

Finish the fuselage by gluing the $\frac{1}{16}$ - and $\frac{1}{32}$ -balsa sheet-cowl pieces in place; then shape the two cowl blocks to the plan outline and glue lower block solidly in place, but use only spots of glue to fasten top block (this will be the way the cowl is fastened).

Trim the cowl blocks to final shape and sandpaper smooth; then, by sliding a razor blade in the joint, the top block can be removed and both blocks hollowed out to make room for the engine. Give the firewall and inside of cowl blocks three coats of black fuel-proof dope, and don't forget the drain hole. Mount the Cox .020 with small wood screws. Spot-glue top cowl block back in place. Finish cowl with sanding sealer and fine sandpaper.

Tail: The rudder and stabilizer are constructed on the plan in the normal manner. The $\frac{1}{16}$ sheet tail surfaces provide a bendable area for flight adjustment.

Wing: Cut one W3 rib to shape carefully, mark it — it can be identified, and use it as a template to cut out all 18 ribs. (The W1, W2, and W4 ribs need only slight modification from the W3 pattern.) Check the size of spar notches as you work to obtain a good fit. Build one wing panel at a time. Notch the trailing edge to receive the ribs, slide ribs in order on the spars, and assemble the unit on the plan. Add the leading edge, wing tip, gusset, and let dry.

When both panels are completed, set the centers together, trim to fit neatly, and with both tips blocked up $1\frac{3}{4}$ ", glue together with the $\frac{1}{8} \times \frac{1}{4}$ center braces and $\frac{1}{4}$ -sheet trailing edge piece. Finish by adding the $\frac{1}{16}$ -sq. top center spars (straight across from W1 to W1). Work carefully building the wing since it is the source of lift and lateral stability for your model.

Covering: Use fine sandpaper to smooth all outer wood surfaces and round the edges of wing, rudder, and stabilizer. Cover the model with light-weight Silkspan. Leave the cabin and turtledeck uncovered until the stabilizer is covered and glued in place, then cover the turtledeck. Cover the rudder and glue in place.

Cover the wing from W1 to W4 with one piece of Silkspan, then use separate pieces for the other panel, the center section, and

Continued on page 74



The first all-metal plane designed and built in the U.S. Extremely rugged, with a high-lift wing, it was shipboard operated.

MARTIN MO-1

A vintage aircraft's functional design is the basis for this Junior-age-class record setter.

DON GERBER AND CHARLES REEVES



The winning records with the MO-1 were set by Don Gerber and son, John, in both Class I and II Navy Carrier. Difference between Classes is use of 40- or 60-size engine.

ONE of the most rewarding aspects of this hobby is the designing of a model and then following through with the building, perfecting, flying, and winning with this aircraft. I tremendously enjoy flying in competition and am always looking for something different, something original that I can call my own.

While I was through the books in a library miles from home, I found the first bit of information which led to the design of this model. The book, "Airplanes of the World—1490-1962" by Doug Rolfe and, of all people, Bill Winter, showed a small drawing of the plane, and gave the information that the MO-1, designed in 1921 as a shipboard observation plane, was the first all-metal plane designed and built in the United States. The word "shipboard" was all the incentive that I needed.

During the summer of 1967 I corresponded with the Martin Marietta Corp. and got a photograph of the real plane and a good three-view drawing. Invaluable was the letter from Martin Marietta verifying the MO-1 as being carrier-based: "In response to your request for verification of the use of the newly Martin-built MO-1, our records indicate that this plane was carrier-based along with the bombing and torpedo squadrons of the U.S. Navy in 1924, but was classed as a light-weight scout monoplane."

With this information I drew the first set

DONALD H. GERBER
JOHN D. GERBER
CHARLES W. REEVES

TRACED BY

SECTION A-A



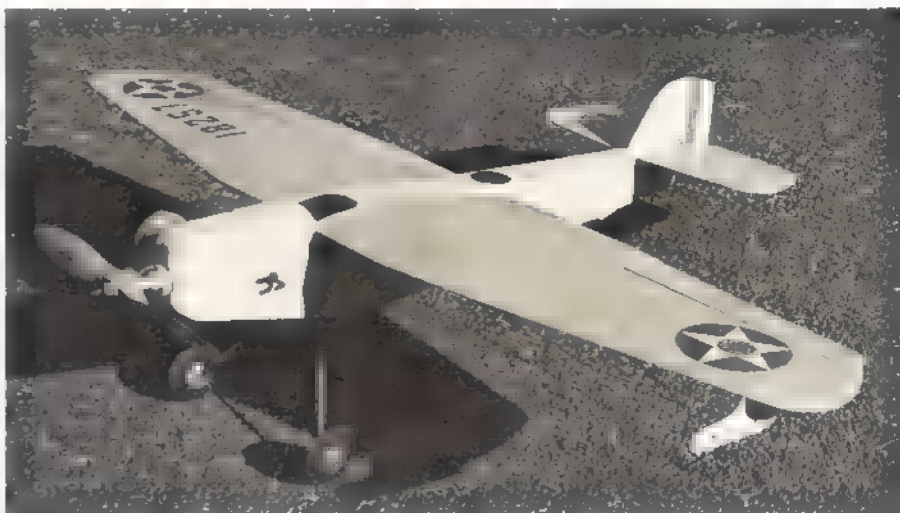
of crude plans. Later that fall I started corresponding with Mr. Don Gerber of Laurel-dale, Pa., who was the current class I record holder. Since he was interested in the model, I sent him a copy of the information that I had, and a rough copy of the plans I had drawn. That winter he redrew the plans in detail, developed construction techniques for both class I and class II versions of the MO-1. He and his son (John) built several of the planes of both classes. The contest record of their MO-1's during the summer of 1968 is phenomenal. They had a total of six first-places, five second-places and one third-place, and these include the AMA class I and class II junior records and a first-place win in junior class I navy carrier at the 1968 Olathe Nats for John Gerber. They had done all this, and I hadn't even started construction on mine.

I should make it clear that this is a joint article presented by both myself and Don Gerber, and that Don should receive the lion's share of the credit for developing and testing the model.

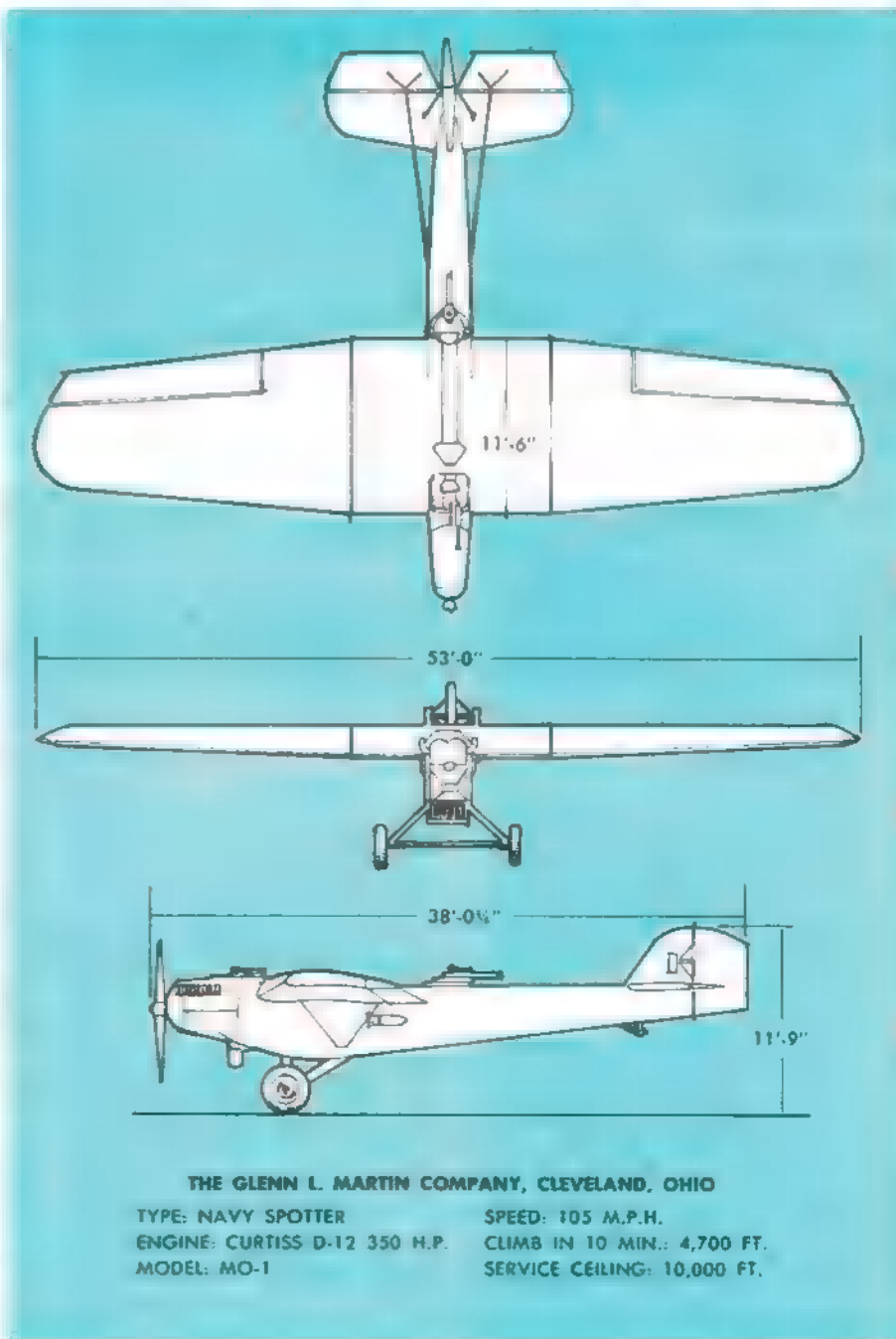
If this plane doesn't convert a few of you rat race flyers to navy carrier, then you just can't be converted, because it ~~has~~ has the looks of a good, clean rat racer. The construction is similar too, with the exception of the metal pan used on most rats today.

Start construction with the solid wing by gluing the $\frac{3}{8}$ " redwood leading edge to the balsa plank and working down the wing with a razor plane to the airfoil shape shown in the fuselage side view and the wing tip section. Make sure the wing center section bottom is flat, out to the point where the leading and trailing edges begin to taper, and then works to a symmetrical

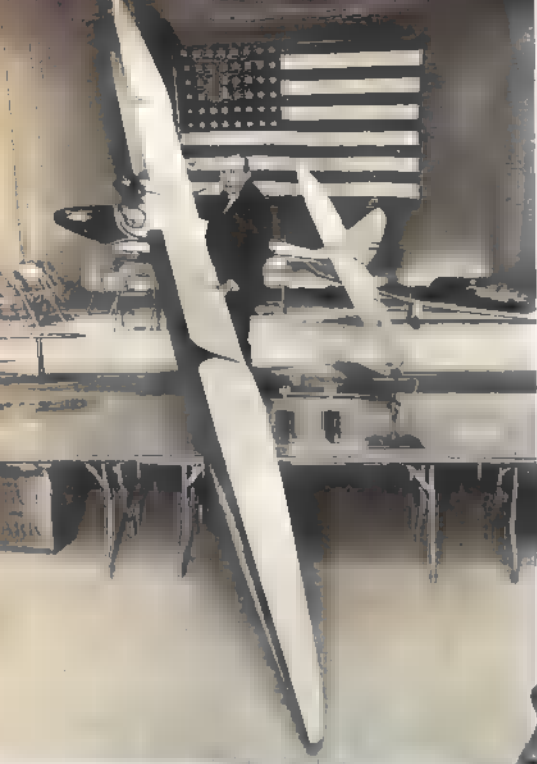
Continued on page 58



Important features here: adjustable leadouts and hinged ailerons instead of flaps.



Rossi 60 speed and K&B 40RR engines set up by Bill Johnson, known as "Throttle Man."



Biggest entry was Best Finish Award winner, a 20' R/C Condor sailplane by Harold Van Horn, Doubled Cleveland Model kit.



Best WW I plane was this R/C Nieuport 11 in realistic white paint job by George Tychan. Five-foot-span, from VK Models kit.

This high-school group was co-winner of the Lew Silvey Trophy. Prize was free trip to Wright-Patterson AFB.



National Plane and

CHARLES TRACY, AVIATION EDITOR, THE CLEVELAND PRESS

CLEVELAND'S aviation industry lends a helping hand every year to its junior-grade admirers who get their kicks from model airplanes. A large percentage of the full-scale air world gets uniquely involved in staging the National Plane & Space Model Show in the Higbee Co. 10th-floor auditorium at the heart of the city.

This was the 22nd year for the glamorous event that excites modelers of all ages and produces some of the finest projects ever assembled. Dates were April 4, 5 and 6.

Under leadership of Benjamin T. Franklin, director of Air Foundation Inc., and the Aviation Dept. of The Cleveland Press, aircraft manufacturers and airlines among firms supplying prize trophies for winners in 36 separate divisions of the show.

In fact, the show has grown to such proportions that it takes more than 50 engineers, executives, model-plane experts, and scientists to inspect hundreds of entries and select winners. They spend an interesting, four-hour evening to do it. But there's never a problem assembling the judging corps. Pilots, plane designers, government aviation officials, and aircraft operators ask to be selected.

An underlying reason is they want youth to get excited about aerospace, a rewarding

industry that today is the nation's No. 1 employer.

There's another reason, too. Model aircraft builders develop a rare knack for original thinking along complex mechanical lines. They work out retractable landing gears, movable controls from cockpits, come up with some amazing ideas for planes of the future, and frequently startle judges with new materials and methods.

Because of all this ingenuity, cultivated by building intricate models that really fly, they become choice candidates for science and engineering careers. The industry needs people with such talent.

Jack Hamilton, vice president of marketing for Cleveland Pneumatic Tool Co., which makes landing gears for such planes as Lear Jets, Boeing 747s and many others, expressed the feelings of the industry when he said: "We like aviation and want to be part of this civic project designed to inspire youth."

The show has just about everything but actual flying. Open-age modelers who enter say it takes two years to create a winning powered-scale entry now because standards have reached such a high peak. Many work in secrecy on copies of historic aircraft so competitors will not know until the show



Best Air Force control-line model in open-age division is Lockheed P-38 by Peter Christ. Disassembles like an R/C.

Glamorous floor auditorium of Higbee Co. department store in downtown Cleveland is annual site for the show.

ALL PHOTOS: CLEVELAND PRESS

Space Model Show

Annual model exhibition brings together modelers and the aircraft industry.

opens just how much work is required to be a winner. Painstaking research goes into the top winners. Credit is given for this.

Planes that have flown also get extra points in the judging. Any plane that has won a first in the AMA Nationals, for instance, can get 10 points added to its judging score. Good performance in lesser meets can gain 5 percentage of this point quota. This prevents a beautiful "hangar queen" that's never been aloft from beating out a plane that has really proved its wings.

Sponsors of the show are Air Foundation Inc., headed by Fred C. Crawford, honorary board chairman of TRW Inc.; Greater Cleveland Growth Assn., formerly the Cleveland Chamber of Commerce; and The Cleveland Press. Their committee collects \$1500 for prizes and expenses from other firms that are members of Air Foundation, dedicated to advancing aviation education.

Higbee's donates space for the show and provides its professional display artists to glamorize it with arranging talent, signs and club insignia which fills the 2000-seat auditorium with colorful planes. (Seats are removed.) Prizes are presented in stage

ceremonies on a Saturday afternoon when everybody comes to see and talk about the planes, perhaps take home one or two trophies.

Show officials have even figured out how to get prizes distributed down below those perennial winners who always win everything and reduce the average builders to runners-up. They created an "Aces" division. There's no limit on how many entries one builder can have, except that all first-place planes from the previous year are barred. Entrants police this rule and there never are violations.

Aces are the five highest-scoring entrants. They forfeit claims for first-, second-, and third-place awards, are presented one extra-special silver cup to represent all their winnings in the show. Then, by a complex reshuffling of positions, all places vacated by Aces are filled in by moving up other entrants within the various divisions formerly won by Aces. This results in people out of prize positions moving into them as Aces are lifted out of competition. The system is well worth the effort and ought to be applied to all big air meets as it develops incentive by spreading rewards down to average builders who often go through

Continued on page 70



Aero Commander trophy to aluminum-covered DC-3 by Daniel Sherry. Plane weighs 14 pounds. Best Commercial Plane Award.



Robert Keenan's much-modified Sterling Stearman PT-17 kit is a near-perfect replica of Bill Adams' famous air-show performer. Note headrest extends to the rudder for fuselage side area.



Upside-down lettering emphasizes the real plane's frequent inverted position. Model flies like the big craft; has considerable control surface area, is quite maneuverable. Scene at '68 NATS.

CONDUCTED BY

RADIO CONTROL WORLD

A ROUNDUP OF LATEST NEWS

HOWARD MC ENTEE

Technical Notes

Elevator trim for GG: Those who have servos, such as the Rand LR3 or Controaire Ghost but do not use the throttle capabilities, may be interested in a suggestion of Al Casper (8703 W. Cheyenne St., Milwaukee, Wis. 53224) to use the throttle arm for wide range elevator trim. Many GG transmitters have trim levers built-in, but often these can't be shifted too far in either direction without getting to the point of "go around" when signaling for a moderate turn. By leaving the transmitter trim lever close to the neutral position, and adding Al's gadget, you can have as wide a trim action as you wish. This will come in "steps," since this is how these servos provide throttle action.

Simply add a small pivoted lever to the normal elevator pushrod attachment point, link this to the throttle lever, then attach your pushrod to the new lever at the point that gives you the desired amount of normal elevator motion and additional trim. Our sketch shows the setup, which Al notes will drive the elevator to down trim with fail-safe (loss of signal thus could possibly prevent a flyaway). Also, the system "gallop" somewhat cuts down.

Your own wind tunnel: Those who wish more knowledge of wing sections than just hearsay, can rig a very simple "open air"

wind tunnel, per drawing and suggestions from George Siposs (10462 Parliament Ave., Garden Grove, Calif. 92640). You need a fairly good-sized electric fan, and an air-stream straightener. Latter can be made of cardboard in many shapes. Circular deal shows is one way, or you use "eggcrate" construction. In any case, the straightener should be reasonably long—all the spiraling tendency must be removed from the fan blast, or your readings won't mean much.

The test wing section is suspended from a "universal joint" it swings freely in every direction. The upper fork of the U-joint is pivoted on the overhead support and provided with a pointer and scale marked in degrees. A very light pointer (soft balsa should be fine), attached to the bottom of the test section, swings on a sheet of paper taped to the floor.

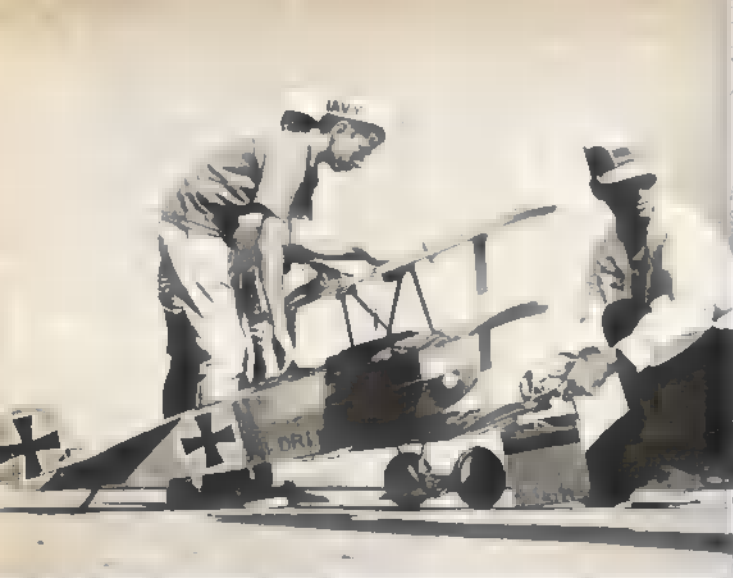
With the fan running, you set the angular scale at progressively larger angles (mark each angle setting on the paper) and note the pointer position. The wing section will swing farther and farther from vertical as the angle increases, until you get the stall point of the section. Then lift will drop off and drag will rise rapidly. You make a pencil dot by "projecting" the end of the pointer to the paper, then join the

dots with a smooth curve, to see how your zip-zip section operates. This very elementary setup won't give results comparable to even the smallest normal wind tunnel, but should provide useful comparative data on a group of different wing sections (made up in the same overall size).

This might make a good entry for youngsters seeking a Science Fair project. Needless to say, a smooth rounded curve that doesn't show a very abrupt drop-off after stall is what we seek for most purposes. Cigarette smoke may be blown through the fan to get an idea of actual airflow under different wing angles. Test section span of around 6-8" and chord of perhaps 2½" should be ample.

Invisible hatch fastener: A pet peeve of Thomas R. Sanders (83 E. Shore Blvd., Timberlake, Ohio 44094) is to see a plane with sleek nose lines and fine finish—and a couple of big pegs with a rubber band over them to hold the forward compartment hatch cover in place. Tom offers suggestion seen here. The cover is far less visible if placed under the nose area, and the retaining band is internal. Internal strips around the fuselage opening provide a seat for the cover edges, and the forward projections on the cover lock it in place.

The monocoque wing: Recent issue of the



Does this give some idea of how large '1/4-scale' is? A Fokker DR-1 Triplane by William Laubengayer has S.T. 11 turning a 23"-diam-eter prop at sort-of-scale rpm's. When running, the prop whistles.



With breeze blowing across the runway, the DR-1 was airborne quickly but made only slow forward progress. Bill proved to all that a shiny finish is authentic. Used Super Quik-Coat covering.

Valley Forge (Pa.) Signal Seekers news-
letter *Hear Ye* extolls the virtues of the
monocoque wing. For those not familiar
with the term, this indicates a wing with no
internal spars. Dan McLain hates to build
wings, and settled upon this form of con-
struction as the easiest way out. Ribs are
employed to keep the top and bottom cover-
ing shaped properly, but spanwise strength
comes strictly from the covering. He has
even constructed 9'-long glider wings this
way! (The wing of Jerry Nelson's big glider,
sold in ready-to-fly form, is built this
way, but utilizes a fiberglass-balsa sandwich
material for the wing surfaces.) Material
selection is important.

Dan has persuaded quite a few VFSS
members to try his methods, with wings
sized all the way from small and docile
rudder planes up to big multi stunters.
Balsa sheeting of the quarter-grain variety
is preferable. For medium-sized planes,
up to perhaps those with 45 engines and
larger, 1/16" sheet seems best. Planes with
01 or 02 engines can use thinner stock, while
those with over 45 power utilize 3/32" sheet.
The only balsa strips are those at the ex-
treme leading edge, where it would be
difficult to make sharp curves in the balsa
sheet. Rib spacing can be even throughout
the span, but latest idea is to use closer
spacing near wing center (1 1/2", for exam-
ple). Gradually open up spacing as you go
toward tips, to perhaps 2". The ribs are
generally attached with contact cement, the

L.E. strip with white glue.

Wings must be built right the first time —
you can't "unwarp" them! Wood strip is
used as T.E. if wing has strip ailerons. For
inset type ailerons, strips are used as
edge into which aileron fits and is
hinged. Wing halves are joined with re-
inforcing band of silk, celastic, fiberglass, or
other material, depending upon size and
wing use. System apparently works well —
and does speed construction.

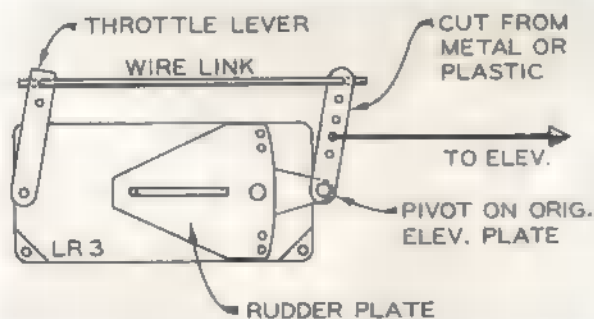
Fuel additive: Members of the Central
Kentucky RCC have been experimenting
for about a year with addition of iso-octane
to their model plane fuels. Their conclu-
sions: the material causes fuel to burn
much cleaner, it gives more power, and a
far longer run from a tankful. It does not
"burn up" engines. After a year of use,
Gene Bradley (one of the editors of CKRCC
newsletter, *The Airfoil*, Blueberry La.,
Lexington, Ky. 40503) claims that engines
are much cleaner than with normal fuel.

Iso-octane is an additive in some makes of
auto gas (Amoco, for example) where it
greatly boosts the octane rating (or reduces
the knocking tendency of the fuel). Its use
in model plane fuels was pioneered by
Charles Frenzel of CKRCC; he and Gene
have given it a full year of use to find the
best mixture, how it affected engines
and on. They have used it mostly in
Enya and K&B engines. From fine results
with these two makes, they think it would
do as well as others. Gene reported operat-

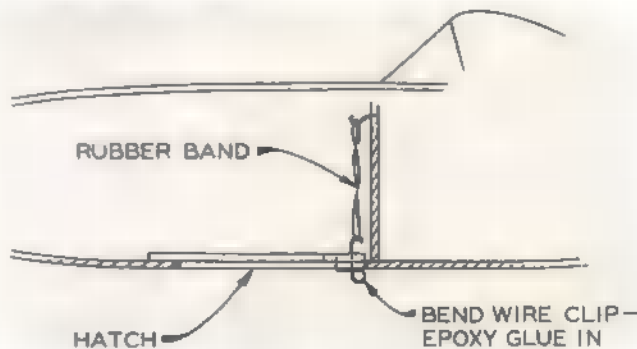
ing an entire season on a single glow plug!

Those who want to try this additive can
get it under its chemical name — "2,2,4-tri-
methylpentane (99.5%) (Pract.) Eastman Ko-
dak EK P 2396" — from E. H. Sargent & Co.
(35 Spring Ave., Springfield, N.J. 07081).
Costs \$2.55 for 500 gms, \$5.80 for 2 kilograms,
etc., and is used as a laboratory solvent
(aside from its use in gasoline fuels). Their
preferred mixture is 4 oz. iso-octane to one
quart of K&B 100, plus a capful of Glow
Life. We understand that Hobby Lobby
Int. (Nashville, Tenn.) sells this material
under the name of White Lightning. They
claim you can run a 60 engine for 12 min-
utes on a 5 oz. tank using this additive!

Muffler conversion: More and more clubs
are inaugurating "muffler rules," in order to
retain valued flying fields. Recent Eastern
clubs to do this route are the DC/RC and
the NJRCC (Northern N.J. area). Latter
group will require mufflers at their field on
county park property for all engines over
15 displacement. In addition to several
makes of mufflers produced in the U.S.,
which we have described in recent issues,
several foreign makes now are sold here.
German and Swiss modelers (mufflers are
mandatory in both countries) are partial to
what are called "venturi" or "flow-through"
mufflers. The Swiss-made KO unit of this
kind is available from Nelson Model Pro-
ducts Inc. (Box 2027, Dublin, Calif. 94566) in
several sizes and models; write them for
data sheet.



The best trick yet with Rand LR-3 servo is this broad-range eleva-
tor trim system by Al Casper. Reduces gallop, too. Most GG flyers
use 049 engines which loose too much power with throttles fitted.



To eliminate the unsightly lines of a fuel tank hatch on top of the
fuselage, Tom Sanders suggests locating it below with internal
rubber-band attachment. Don't put anything heavy above it!

Last month in this space we described ■ conversion worked out by Californian Bill Willis, for the ST mufflers. This, too, ends up as flow-through design. (Prices for the conversion parts only, are: \$3.00 for the medium size (#51/1) muffler and \$3.50 for the largest (#71/1) ST unit.) However, owners of Supertigre and some other engines should check one point before fitting this or any other type of muffler to their engines. Look to ■ if the engine utilizes "sub-piston induction." Peer into the exhaust ports and turn the shaft until the piston is ■ high in the cylinder as it will go (top dead center); if the lower edge of the piston—or any side cutouts of it—leave an opening at the lower edge of the exhaust ports, your engine will most likely be a real dog with a muffler.

Why? The designer allows this under-piston air intake into the crankcase to promote efficiency; it augments the crankcase charge that comes in via the normal carb intake. With no muffler or lengthy exhaust stack on the engine (a normal exhaust throttle, when open, isn't very detrimental) fairly clean air goes through the exhaust ports into the case. But with a muffler, you get a load of burned gases. They dilute and heat the crankcase mixture leading to heavy loss of power. Since Supertigre makes a very neat muffler, some modelers feel these units will work beautifully ■ all ST engines. Unfortunately, 'tain't so. Oddly, some ST engines have sub-piston induction, others in the same "series" do not. We checked a ST.56 which does, but a ST51 we've flown a lot does not. The latter engine worked well with a muffler, with just a modest power drop. Supertigres aren't the only engines with S.P.I.—quite a few others use this principle too.

National Guard interference: When driving in to a model flying field in the North-

east, we noticed a group of National Guardsmen clustered around what was obviously a "communications truck." We asked them what frequencies they used, were told that they were sure their transmitter was much higher than what we ■ for radio control. The man who knew the exact spot frequency was located, told us "We transmit on exactly 72.2 MHz!" Since this is only a few hundredths of a MHz from our 72.24 spot, the conclusion was obvious. If you see National Guard maneuvers anywhere ■ your flying area, check carefully to ascertain the frequencies they ■ using. No ■ to complain to the FCC about such interference—we were given the 72-76 MHz spots "subject to interference from other legally-operated transmitters on this band," or words to that effect. The Guardsmen mentioned above thought all R/C operation was conducted on the 27 MHz Citizen's Band.

Grassroots

Winter hazards: Item in the Tri-Valley R/C News (Tri-Valley RCC, South Bend, Ind.) intrigued us. Said that while Loren Pratt ■ flying his plane (we presume during ■ cold damp winter day) he noted the craft was becoming nose-heavy and he applied some "up trim." He had to do this several more times until all the trim range was gone. With constant back pressure on the stick, the plane was brought in for a good landing—and the cause ■ immediately apparent. Model was "iced-up." Estimates were that it must have weighed around 10 pounds with its load of ice!

Definitions: Seen in Memphis Monitor (Memphis, Tenn., RCC): Happiness—6" off the blacktop at 100 mph and still not crash-in! Dexterity—Holding an oil-soaked Goodyear racer in one hand, the starter with the other, adjusting the needle valve ■ same time turning it all over without

getting your tie caught in the prop! Panic—The instant (after launch—Ed.) that you realize your receiver is turned off!

Get-Acquainted booklet: Model for a booklet to hand to new and prospective members of a club is seen in a 12-page effort put together by the District of Columbia RCC. It includes info ■ how to join, how the club started, outstanding members and their particular R/C developments, club social and competition events, detailed maps showing the club flying fields and meeting place. Also the constitution and by-laws, a little info on R/C ■ a hobby and international sport, its applications to science and engineering, list of past presidents, and flying field regulations. One provocative paragraph needs emphasis: "What can I do for the D.C.R.C.?" With well over 200 members, this big club really needs such a publication. But other, and much smaller, groups might find something similar of real use to them. Going out on a limb, we think the DC/R/C might be willing to send a copy to interested clubs; you can reach them c/o their Secretary (Carl Maroney, 11429 Cherry Hill Rd., Beltsville, Md. 20705).

Hardwood airplane: Coming across a nice clean redwood plank in his cellar, Mike Klintworth (member of the Whirlwinds, St. Joseph and Benton Harbor, Mich., club paper, "Breeze") sawed off a $\frac{3}{16}$ " thick sheet, was impressed by its strength and light weight. This started a building project that ended with ■ "hardwood Phoenix." Full-length sides were cut to shape from the $\frac{3}{16}$ " redwood sheet. The firewall was $\frac{3}{16}$ " ply, cross-pieces back through the fuselage were $\frac{1}{16}$ " sq. redwood. The rounded turtledeck was fashioned from clear, dry white pine, with strips to start the curved shape, and topped with a piece of $\frac{1}{8}$ " pine that was hollowed to about $\frac{3}{16}$ " thickness. With all parts well cemented,

An editorial 'Perhaps the props just can't be expected to take this ever-increasing power—and the increasing vibration that often accompanies it.'

Editor's Note: Realizing the importance of this editorial, we have obtained the response of the manufacturers involved.

This will be found after Mac's editorial. There is no present answer to this propeller problem. You can be sure when ■ solution is found—the manufacturers will use it! Until that time we can only urge SAFETY on the flying field.

"I was lucky," proclaims the editor of Flypaper (R/C Flying Club of Toronto). He had just demolished his multi plane, which crashed out of control on ■ road edge. Repairs and replacements cost some \$70—to say nothing of perhaps 50 hours of his time to get back in the air. Lucky? Read on.

On a nice Saturday, the plane was flying fine when a couple of white objects were seen to fly off—the engine started to scream. Fortunately, the engine could be cut and there was enough altitude to make ■ good landing. The Nylon prop had shed both blades at the hub! Lucky so far.

Another Nylon prop was put ■ the 56 engine and the plane had three more uneventful flights. The following weekend, it was again airborne, same engine, same prop, same fuel, etc. Shortly, this prop shed one blade. Vibration was so bad the engine couldn't be throttled. The plane became completely un-flyable, crashed ■ noted. But he was still lucky! Why? Those blades could have flown off while the engine was being peaked out on the ground, or while it was flying closeby.

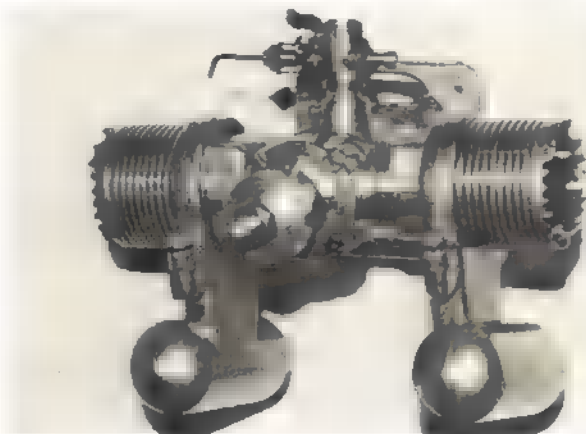
Canadians are touchy on this matter; one flyer lost an eye to a broken prop blade (admittedly this prop was of a plastic

other than Nylon). Another flyer was starting a 61 engine when the Nylon prop shed a blade, cutting him severely over one eye. Other flyers have lost blades on the ground and in the air—sometimes losing the plane too.

Most of us recall recent and similar incidents. Engines with more and more power are being marketed. Perhaps the props just can't be expected to take this ever-increasing power—and the increasing vibration that often accompanies it. One prop maker suggests that his Nylon props should be boiled in water before use—another doesn't think it's necessary. And one club paper editor (U.S.) stated that this possibly vital safety precaution should not be left to the purchaser—who more often than not just doesn't bother. It's apparent that better and stronger props, possibly better materials, are needed.

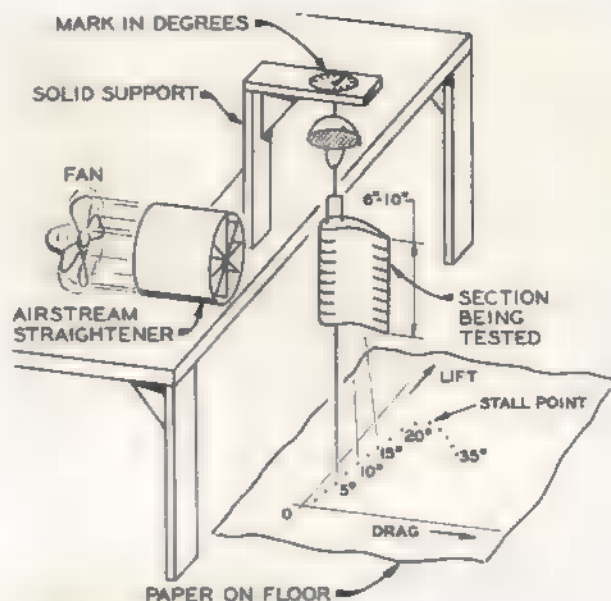
Meanwhile, what precautions should we take? Start your engine in low or medium speed, then move back of the prop to peak it out at top. Do not run engines in the pit area—the noise and the dirt stirred up should preclude this anyway. Demand better balanced props (and engines) from the manufacturers. Until we can get them, carefully rebalance every prop before you use it. Use only wood props on the large engines—possibly those of 40 cu. in. and over (and balance these props before use, too!). Don't use Nylon props in cold weather, when they apparently become much more brittle. Inspect all props most carefully when you buy them, and again before use. Don't use or buy props that have any noticeable flaws whatever in the hub ■ (flaws include evidence of internal bubbles, nicks,

Continued on page 72



There is much interest in vibration-free twin-cylinder engines. Now in production is the Kronk 61 Twin, a German import. It offers as much power as conventional 60's. Comes with mufflers.

An open-air wind tunnel by George Siposs is helpful only for very basic airfoil performance studies. Try it and see the differences between the popular airfoils used on our modern R/C models.



Mike started smoothing the whole assembly to shape (he comments that pine doesn't sand like balsa!).

Stab was framed with white pine, sheeted with $\frac{1}{16}$ " balsa. Elevators of redwood, fin and rudder of $\frac{1}{16}$ " sheet balsa, of balsa blocks for in working to the desired shape. Foam wing has $\frac{1}{4} \times \frac{1}{2}$ " spruce spars top and bottom, is sheeted with $\frac{1}{16}$ " pine. The fuselage, with no gear installed or any finish, weighed 1 lb. 11 oz.; as Mike comments, "... it is an extremely strong piece of merchandise." The wing, less ailerons, tips, or fibreglassing of center section totaled 2 lb. 4 oz. The finished plane with Heathkit (1968 version) radio and Veco 61 weighs 1 lb. 2 oz.

Acrylic lacquer was used on the entire plane. The primer and acrylic applied to the wing added 1 lb. to that component. Though not too happy with wing weight, Mike feels the fuselage out very well, in view of the materials used. He notes, "One thing for sure, when we fly through the trees with this baby, we are going to

take off a little bark." That's for sure!

Monmouth 4th Annual Show: Swamped at their 3rd annual last year, the Monmouth MAC rented a large exhibition hall in Asbury Park, N.J. for their 4th R/C Show, held April 27. Some 1000 persons paid admissions, but were rather lost in the large space. Although it is doubtful we have reached the saturation point in such shows, new factors must be considered in future planning.

Around 30 manufacturers had tables for display. Much table space for showing planes built by individuals went unused — aren't modelers proud of their creations any more? Prizes 3rd place in eight different categories should have been incentive enough for a bumper turnout of such models. The MMAC gang also had a Swap Shop and had scheduled an information banquet for Saturday evening. Pre-show publicity was excellent and widespread. How were they weren't swamped?

Most people felt that more than show in any area within a short time is too

much; a similar show, just north of NYC, a month prior to the MMAC affair, drew out most of those who will attend such affairs in a given area. We've made pleas in past issues for more of these local R/C shows — but not in the same general area at the same general time! Perhaps it is time for the RCIA (to which organization most of the manufacturers and many dealers in field belong) to issue "sanctions" for such shows to prevent duplication in any one area. Manufacturers just can't afford the time and expense to travel long distances to these affairs, unless they are assured of a really big turnout.

Possibly such local shows (unless they are held in far from any similar show, and far from such super-shows as MATS and Toledo) can't bring out enough modelers to justify the expense of a two-day show. Beautiful Spring weather may work a disadvantage! Modelers who have been aching to get out to the flying field may just decide to go fly, not to a show.

Continued on page 56



The proposed twin-rotor 60 Wankel engine to be produced by Graupner uses single carb. is small, but quite powerful.

Fred Militky holds Graupner's unusual injection-molded fuselage Cirrus glider. Lovely slope-soaring hill in background.





Backyard flying at its best with tiny scale planes which use the most basic rudder-only pulse-control system. Very inexpensive.

Author launches the Sperry Verville Messenger. A smooth, level hand-launch is most important. Takeoffs are a bit too tricky.

R/C Mini-Scale

With modern light gear and .010 engine, stable flying-scale birds can be built right from magazine-size plans.

DAVE ROBELEN

WOULD you believe a 13" span, 2.4-oz., true-scale Sperry Messenger? Or a 19", 2.6-oz. Corben Super Ace? Recent developments in R/C equipment, plus a few different techniques, have made such models practical. Also included in my fleet is an 18" span Lil Esquire that is an example of a model of a model.

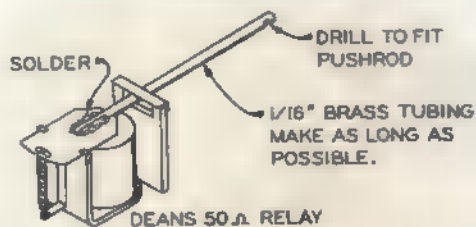
All are easy to fly, being much more gentle than many larger types. The Sperry, for example, zooms along at, perhaps, 15 mph and is very steady. The main reason for

this is the light wing loading. Simple to construct, these little models ■ well within the capabilities of Mr. Average Modeler.

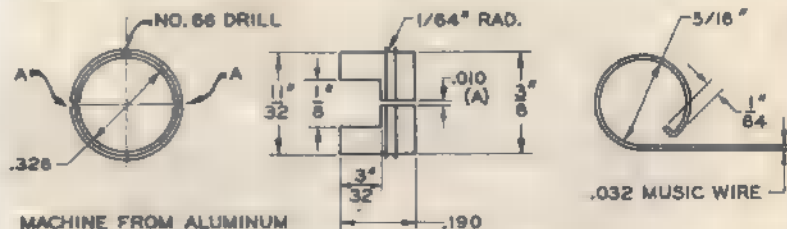
In choosing ■ aircraft to copy in miniature, there are ■ few requirements to consider. Only one powerplant is suitable for these dwarfs: the Cox Tee Dee 010. The radio systems ■ proportional rudder-only with actuators that are low in muscle and battery drain. These requirements establish ■ model size of approximately 60-80 sq. in. wing area with a total weight of about 2.5 ■.

These aircraft must have sufficient dihedral for good rudder turns. The tail sur-

faces should be large enough for stable, safe flight. If you are working from plans for a larger model, the stability requirements will most likely have been met. The dihedral, however, should not be excessive ■ a jerky flight will result. About four degrees under each wing panel is excellent for a cabin monoplane or biplane, while a low-wing design would need about seven degrees. When working from drawings for full-scale aircraft, be careful that tail surfaces are not too small, or dihedral insufficient. When in doubt, compare the airplane to ■ successful model, or ask someone familiar with model design requirements.



RELAY ACTUATOR DETAILS



COX .010 MANUAL SPEED CONTROL

The little rudders need only the power of a 50-ohm relay; movement is increased by armature extension.

Don't attempt to fly without an exhaust restrictor. Engine has more thrust than plane has weight! Your local machine shop probably can make the restrictor for you.



Corben Super Ace has neat, inverted-engine installation. It is always easy to start, if you prime with the exhaust ports closed.

The Ace flies faster than the Sperry and has a built-up wing. These light models are nearly unbreakable. Note vertical antenna.

The success depends upon a reliable engine. It must be clean. The jet holes in the carburetor are so tiny, and the flow of fuel so small, the tiniest piece of trash in the jet holes can spoil a flight. The fuel should be filtered. Silkspan works well, or get some filter paper from your druggist. A transparent fuel container is handy. There are a number of good polyethylene plastic bottles available. Avoid glass bottles for safety reasons.

I use a glass hypodermic syringe to transfer fuel to the model tank (you can see how much you are placing in the tank) to minimize overflow spillage. This also allows you to make a last check for dirt in the fuel. That long needle also makes it very easy to fill tanks that have vents in odd locations, such as the Corben where the vents are inside the cowl. The Cox fuel in the blue can has always worked fine for me, but at higher elevations above sealevel the red-label fuel may be necessary. The blue-can fuel is much easier on model finishes, however.

Since the 010 Cox engine has far too much power for these tiny models, the power output must be reduced. Don't depend on a rich engine run because a sudden burst of full power will carry the model nearly out

of control. Restricting the exhaust is by far the most reliable method of reducing power. The muffled exhaust note is a pleasant side-effect.

The restrictor should be a variable type that can be opened to start and restrict the engine, then closed to the desired level. The restrictor consists of two precision-turned aluminum half circles and a wire spring clip to hold them in place in the cylinder. This wire clip also serves as the actuating arm that moves the restrictor. (The drawing shows dimensions.) The restrictor is available from ACE R/C and will soon be available from Cox, also.

To install the restrictor, first remove the engine cylinder and clean thoroughly. Use a small file to smooth any burrs on the outside of the cylinder. Fit the restrictor to the cylinder before the cylinder is replaced on the engine. This allows the spring clip to be slipped into place over the bottom of the cylinder. After replacing the cylinder bend the wire arm to the most convenient angle.

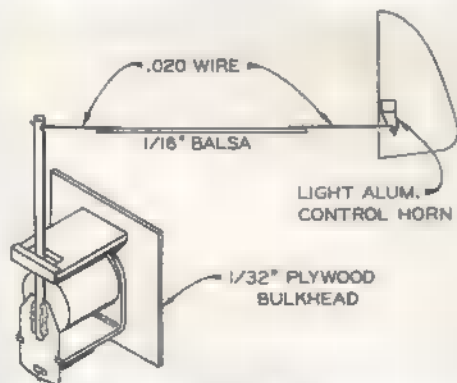
Run the engine a few times before installing in order to become familiar with the restrictor, and approximately where to set it. Use a 4 1/2 x 2 Cox Nylon Hi-Thrust propeller in place of the 3" propeller furnished;

this gives greater fuel economy, and makes starting easier. With this propeller, the ports are almost closed when the restrictor is set for flying.

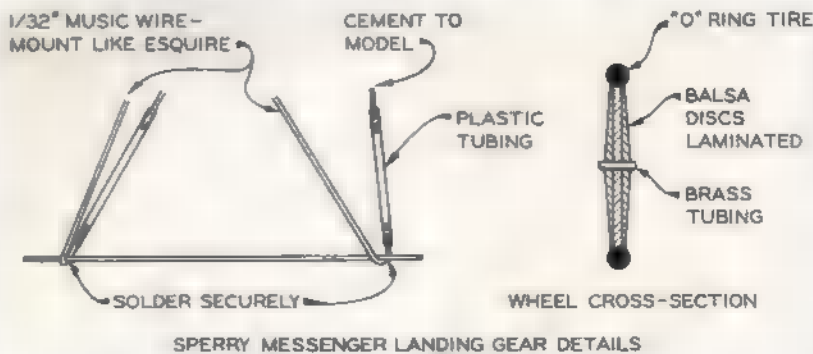
Choice of radio equipment is limited because the maximum weight for the equipment can be only about 2 1/2 ozs. total. Only two receivers are currently available, both superregens with similar battery requirements. One is custom-built by Hilmar Bentert (1 Berlin 31, Zahringer Strasse 33A, West Germany). It comes with an 80-ohm magnetic actuator and costs approximately \$35. The actuator is \$5 when purchased separately. Although the receiver is a super-regen type, it only accepts a tone near 3.4 khtz. Thus, it is relatively immune to interference. Mr. Bentert can supply a small transistor transmitter with built-in pulser; power is 150-MW, and it produces the 3.4 khtz tone required by the receiver. It costs \$35, less batteries. (Payment should be by international money order.)

The other receiver is the ALBIN, available from ACE R/C. This receiver is a single-output relayless type, and may be used with the Bentert actuator, a modified relay to produce proportional control, or a Baby Adams actuator. The ALBIN receiver may

Continued on page 62



There should be no bends in the pushrod between actuator and rudder. No slop or binding allowed.



Since we really can't expect to make graceful landings with such tiny wheels, the landing gear can be light wire and the wheels sandwiches of balsa with O-ring tires.

TRY YOUR DEALER FIRST

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Canada, Calgary, Alberta
CALGARY HOBBY SUPPLY
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Canada, Prince Rupert B.C.
PRINCE RUPERT R/C CENTRE
938 5th Ave. East

Canada, Saskatoon, Sask.
SASKATOON RADIO CONTROL CO.
Box 1429

Canada, Toronto, Ontario
KLEIN BROS. SPORTS & HOBBIES
2187 Balmert
Phone RU 7-0631

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Colorado, Pueblo 81001
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Connecticut, Bridgeport 06610
FRED'S VARIETY
184 Bucares Ave.

Connecticut, Hamden 06516
HAMDEN HOBBIES
1884 Quail Ave.

Connecticut, Windsor 06095
SHIPS ELECTRONIC SERVICE CT.
6 Spring Street

DELAWARE

Delaware, Wilmington 19803
SIMPSON'S HOBBIES INC.
788 South Road
Fault at 1000th Road

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Florida, Jacksonville 32211
ART'S HOBBY SHOP
10224 Atlantic Blvd.

Florida, Miami 33142
ORANGE BLOSSOM HOBBY SHOP
1975 N.W. 35th St.

Florida, Tallahassee 32303
WILSON'S DISCOUNT STORES
AIA
Start Shopping Center
P.O. Box 262

Florida, St. Petersburg 33704
FLORIDA HOBBIES & RACEWAY
2801 9th St. N.

Florida, Tampa 33605
FARMER'S HOBBIES & HOBBIES
4928 East Broadway

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Hawaii, Honolulu 96814
PETE'S MODEL CRAFT FUM
1042 Ala Moana Shopping Center

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Illinois, Chicago 60630
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KEN'S R/C HOBBY SHOP
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ACE R/C

SERVES YOU FOR ANY R/C NEED
SERVING YOU SINCE 1953



FOR THE NEW MINI PLANES

Looking for new R/C ventures? Join the swing to the new mini planes which have appeared in recent model magazines. Specialize in the light weight components you need for these jobs. You will find listed just a few of the items we have now—more being added regularly. Join the swing to fun—build 'em small and have a ball!



ADAMS BABY ACTUATOR

From Adams comes the AR Baby actuator. Results in lower drain for an all lighter weight. Plenty torque for the mini jobs, the AR only 40 to 50 milliamps current drain on 2.4 to 3 volts, so it can be used with some of the smallest batteries for a tremendous saving in weight.

Uses the same frame and is the same size as the regular Baby, but the secret of the weight saving is in current consumption. Weight of the AR is 17 grams.

No. 14K31—Adams AR Baby Actuator.....\$8.45
For modelers who have the regular Baby and want to convert to lower drain coil, it is available separately. Conversion is simple and takes only a few minutes with hand tools.
No. 14K32—Adams AR Coil only.....\$4.00

TWO NEW TWIN ACTUATORS

The Baby Actuator by Adams is now available as a Twin in either the regular or AR version. The twin magnets provide approximately 2 1/2 to 3 times the torque of the single units and increase weight only slightly. The regular and AR Baby weigh approximately 17 grams, while the Twins weigh 34 grams.

The regular Baby Twin has the most torque pulls around 110 mah on 2.4 volts, while the AR version pulls 40 to 50 mah at 2.4 v. The AR is designed for the Micro and Mini of planes where weight is important. Smaller batteries are used to keep overall weight as low as possible.

No. 14K58—Adams Baby Twin, regular coil.....\$10.95
No. 14K59—Adams Baby Twin, AR coil.....\$11.45

ACE

Accessories Components Equipment

Whether it's Tufline fuel tubing, or a 2/56 1/4 machine screw, or an item from almost any major manufacturer, the chances are good that Ace has it in one of the most comprehensive lines of Accessories, Components or Equipment available anywhere. Our own designer-approved radio kits are added to by lines from E-K, Bonner, Lanier, Midwest, Bee Line, SPL, Coverite, Jensen, Rocket City, Su-Pr-Line, Sterling, MRC, Enya and Webra, etc., etc., etc.



PROFILE R/C PLANS AVAILABLE

Full size plans for the Mini Profile R/C Plane available now for the Fokker D-VIII and the Nieuport 17, and the Mini-ot—the Mini-ot is a profile version of the Blériot. This spans 3 inches. The others average about 1 1/2 inches. Plans are by Chris Soenksen.

The Mini Planes are the hit of the Toledo R/C show. They are offset printed and are 17 1/2, and include a "how to" sheet of information. Price includes FIRST-CLASS MAILING.

Join in the latest challenge hit R/C—Build a Mini Profile!

No. 13K31—Fokker D-VIII Profile Plans.....\$1.00
No. 13K32—Nieuport 17 Profile Plans.....\$1.00
No. 13K291—Mini-ot Profile Plans.....\$1.00

SPECIAL OFFER

Until August 31 we will offer your choice of the plans FREE with the purchase of a Commander R/O Baby Pulse Package. Offer limited—and you MUST ask for it.

MICRO FLEX HOOKUP WIRE

You need a lighter weight wire than ordinary hookup when building the miniature jobs. We have #30 PVC insulated with 7 strands of #30 only .033 diameter. Packaged in a Six color pack each length is three feet long.
No. 35K3—Six Pack hookup wire #30.....\$1.00

VOGT THROTTLE RESTRICTORS

These are a must when you want to tame the Cox .010 or .020. Simply set to position for the desired RPM and you have a tame power plant that is just the ticket for the new mini and semi-scale planes. Be sure to order the correct one for your engine—not interchangeable.
No. 16K105—Vogt Restrictor for .010.....\$2.00
No. 16K173—Vogt Restrictor for .020.....\$2.00

COMMANDER PULSE

DE SUPERHET RECEIVER

This is the first superhet receiver to be produced by Ace R/C! And it is a first in many respects: Small—measures only 1 1/2 x 1 1/2 x 1 1/2. Light-weight is about .8 ounce; Relayless—double-ended (DE) with 1 amp transistors; output for hookup direct to dual coil actuator. Low voltage—works reliably at maximum range on just 2.4 volts; Versatile—works with most transmitters of from 400 to 1400 hz; Pulses exceptionally fast.

Manufactured by Ace exclusively under license agreements with designers—several circuit breakthroughs found only in this unit.

No. 12K1—Commander DE SH RX Pulse Assembled.....\$26.00

(Specify frequency: 26.995, 27.045, 27.095, 27.145 or 27.195)

NOTICE

RAND



Rand Rack and Actuators and Packs are manufactured by Ace R/C at Higginsville, Missouri. The changeover was made earlier, production has been moved.

Herb Abrams will continue as the designer and consultant for the Rand manufacturing portion of Ace R/C, and this will ensure you new Rand items of quality leadership in new fields that you have to expect.

The only thing that has been changed about the Rand products is the location of their manufacture. The same high quality, the imagination, and the same dependable performance that you have come to expect from Rand products will be carried on.

NEW! NEW! NEW!

New items coming in are Glo Wild, Dayglo Fluorescent Decals, Breiten Combo Wire Benders, Sullivan Bendable Brass Tubing, new items from DuBro and Goldberg, Deans and 6 and pin GOLD connectors. Many more.

VERSAPRO

We have components and parts packages for all of the Versapro systems as detailed in "American Aircraft Modeler", by Fred Marks, in recent issues. This is now sent with new catalogs. The Versapro series allows a great flexibility of choice, and the information is contained in our supplement 69-1 and 2, which are an integral part of the second edition of our '69 catalog. Catalog postpaid is \$1.00. See below.

SERVO MECHANICS—Controaire S-3 and S-4 and Kraft-Hayes KPS10. For the tinkerer to make his own digital or analog servo. All complete with motor, feedback pot, gears, shafts, output hardware, etc. S-3 and S-4 in easy to assemble kit form; KPS10 preassembled. Mechanicals only, no electronics. No. 14K17—S-3 \$9.98; No. 14K18—S-4 \$8.98; No. 14G55—KPS10 \$13.95.

LAHTI ANALOG SERVO ELECTRONICS—Complete kit of all electronics needed to make excellent analog servo with highest resolution from S-3, S-4 or KPS10 mechanics. Use with the AAM decoder for simple rudder only NON-FLAPPING control. No. 15G31—Lahti Analog electronics only kit, \$11.95.

AAM PULSE AMPLIFIER-FILTER provides the analog signal required from the Commander DE receiver for use with analog servo. This provides proportional with flapping of the surface. Much more powerful and current only when servo is in motion so smaller batteries may be used. Kit contains PC board, transistors and components for filter. No. 15G24—AAM Analog Pulse Amplifier Filter \$6.95.

MINI GG ACTUATOR PACKAGE

Don Snell designed this GG actuator for Rudder and Elevator for .010 to .049 ships, and are proud to present a kit of all components required. Weight approximately 35 grams and measures 2 x 1 1/2 x 1 3/8". Current drain is approximately 70 ma on 1.2 volts.

Kit contains low drain five pole motor as used in digital servos, synthane base plate, hardware, including gears, etc., as well as simplified instructions to allow you to complete in less than 1 hour.

For with relay receivers, or with the Ace AOSM kit with almost any relayless receiver on one set of batteries for savings in weight.

No. 14K28—Mini GG Actuator Package.....\$7.95

THE PULSE LEADER



The airborne packs of the Ace Commander R/O Packages are deliberately separated into components of receiver, battery and switch, and actuator. This allows for versatility.

COMMANDER R/O PULSE PACKAGES

Ideal for Beginners and Sport Fliers

Get one of the Ace Commander R/O packages and you get the Commander Superhet Receiver, Commander Pulse Transmitter, Adams Actuator of the you want, along with matching nickel cads, completed wiring harness, AND you save up to \$10.00 over buying singly.

We have the packages matched sets in three basic offerings to suit your every R/C sporting need from the smallest to the larger sized aircraft. Ready for easy installation.

The Baby Pack is for the .010 and .020 jobs although it can be used with tame .049's. Pack has two GE 225 BHL nickel cadmium batteries and Baby Adams. With wiring harness and switch, completely assembled.

The Standard uses the LV Single Adams for power for .049 to .07 size. Is furnished with two GE 600 ma BHL nickel cadmiums. With switch harness, assembled.

The Stomper uses the LV Twin of the Adams line for .15 or even .19 size jobs. Comes with two GE 600 cylindrical cells. With switch harness, assembled.

(Charging equipment not furnished.)
No. 10G15—Commander R/O Baby pack.....\$69.95
No. 10G16—Commander R/O Standard Pack.....71.95
No. 10G17—Commander R/O Stomper pack.....74.95

PROVEN WINNER!

ACE VARI-CHARGER



IN KIT FORM OR ASSEMBLED

Will charge cadmium batteries—20 mils to 150 mils. Capable of charging up to 12 volt packs. Indexed dial simple chart for correct milliamp reading for charging different size battery packs. Completely isolated from AC line supply. extra deluxe New transformer highest quality. UL approved line cord. On-off switch. 500 milliamp diode. Full instructions.
No. 34K21—Ace Vari-Charger assembled \$8.95
No. 34K22—Ace Vari-Charger Kit 7.50

NEW HANDBOOK-CATALOG FOR 1969!

For the Fun Flyer and Tinkerer

Our 1969 Handbook-Catalog is bigger and better than ever. specialize in equipment for Beginner, Sunday Fun Flyer. More items for the do-it-yourselfer; more products from major manufacturers, in addition to many Ace exclusives. Greatly enlarged section. Last year this called "bible for R/C", "a MUST!" by R/C editors. Price is just \$1.00 POST-PAID. This is completely refundable on your first order! And that puts you on our mail list for newsletters and R/C Data Service—acclaimed the world over. You can't lose—send your buck a round trip today. It could be the dollar you ever spent!

It's Bigger!

It's Better!

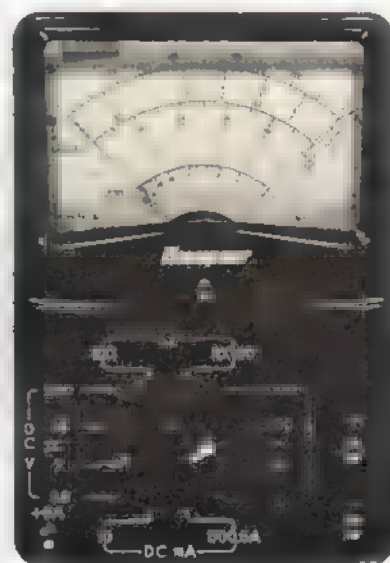
ACE CONTROL • HIGGINSVILLE, MISSOURI 64037

Name _____
Address _____
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QUANTITY	STOCK #	NAME OF ITEM	PRICE	TOTAL

Important: For overseas delivery on catalog or Binder please add 50¢ for additional postage.

Guaranteed delivery anywhere. Orders over \$5.00 sent prepaid. Orders under \$5.00 please add 50¢ for postage and packing.



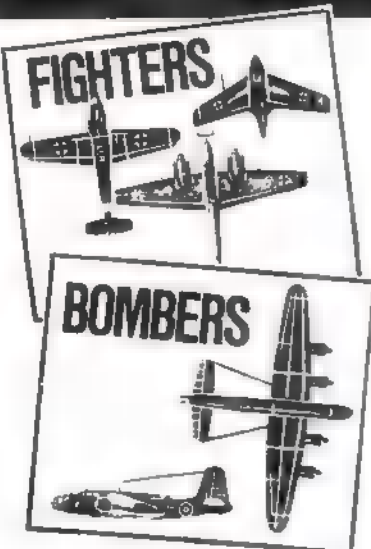
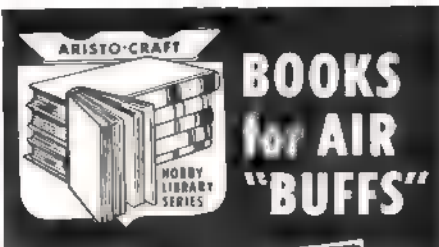
R/C MULTITESTER

Multitester designer for RC. This Multitester is distributed by Graupner for the European countries and is made especially for them in Japan. It was selected over all others by Graupner as a top RC meter. This gives indication the quality and precision. This identical meter now is made for Ace R/C for distribution in the United States.

DC milliammeter ranges of 100 and mA; volts 3.5, 7, 14, and 250 volts. Measures resistance 2000 ohms and 200,000 ohms. 2,000 ohms per volt.

Handy pocket size. Measures 3 1/2 by 5 by 1 1/2 inches. Complete with test leads.

No. 22K5—Ace Multitester.....\$13.98



MEN & MACHINES \$4.95 (HARD COVER)

These books embrace the aircraft, armored fighting vehicles, uniforms and the amazing variety of the armaments by the nations which were embroiled in the two Great Wars of 1914-18 and 1939-45. The fighting men and their machines are all described and illustrated in minute detail.

This series is launched with books on aircraft: the fighters and bombers of World's Air Forces. Each book contains sixteen pages of full color plates devoted to the fighting aircraft of the Royal Air Force, the German Luftwaffe, U.S. Air Force, Armee de l'Air, the Soviet, Japanese and Italian Air Forces.

Every aircraft is described and illustrated with accurate, five-view colored drawings. These first two books will be followed by others shortly. All in all, the series will encompass 14 volumes. Watch for them.

ALL AIRCRAFT ARE OF WORLD WAR II VINTAGE

RAF BOMBERS of W.W. II (Vol. I)

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Model Rocketeer

NATIONAL ASSOCIATION OF ROCKETRY

1239 Vermont Avenue NW Washington, DC 20005



DIVIDE THE U.S. INTO SIX AREAS

In March, NAR's Director of Section Activities, Bob Atwood, announced he plan to divide the U.S. into six areas known as "divisions." The six areas have been commonly used by other organizations successfully for nearly 100 years to accomplish Bob's proposed goal: to assist in the conduct of NAR activities on a more local level.

The change would especially benefit those sections west of the "Ole Miss" that have a difficult time planning to attend NAR events in the east. Bob also noted the possibility of extending the breakout further by department heads for each state, and finally, to urban chiefs for the major concentrations of population.

The six areas are: Pacific, Mountain, Southwest, Midwest, South, and Northeast. More info will be forthcoming. Meanwhile, though Bob had this plan under study for more than a year, he welcomes section ideas toward its success. Write to: NAR DSA, Rt. #3-Box 98B, Annapolis, Md. 21403.

NO RECORDS — NO WORLD CHAMPS?

This month NAR's eleventh national model rocket competition will be hosted by the U. S. Air Force Academy, Colorado Springs, Colo., Aug. 11-15. Each NARAM generates a great amount of interest in the "setting of records." Soon after NARAM, however, this interest is forgotten by most sections — some with the very potential to establish a U. S. first.

The fact that a nation's contest board chairman has not received a record attempt forward for an NAR FAI (Federation Aeronautique Internationale) world records only increase the opportunity to European and other modelers who have but one goal in mind.

One NAR official brought this fact to light recently, adding that if American model rocketeers fail to face the present challenge, they stand to face competition across the entire spectrum of international model rocketry in the near future. In fact, first official records in FAI could be established this summer by 1970. (See April AAM.)

How long has it been since your section took special time at one meeting to review the contents of the '67 pink book, used it to plan six months to a year in advance those local-area meets, and ensure that all members understand both the point system and record attempt procedure?

Record attempt forms are available from the NAR Contest Board Chairman, Albert G. Kirchner, 49 Cheshire Rd., Bethpage, N.Y. 11714. (Credit — BM, PVS.)

N. J. ROCKETEERS LAUNCH NEW CONCEPT

A series of meetings during January and February has led to the formation of four different New Jersey groups into a large NAR section. The section will be called "Pascack Valley" and will consist of the

four districts which pioneered the change: Kenilworth Rocket Research Society, Orbital Rocketeers of Fanwood, Rocket Club of Piscataway, and PVS of NAR. Each of the four districts has at least one NAR senior member, a launch site, and a place to hold regular meetings.

The small groups decided to join together for the obvious advantages in their area if they could belong to a large NAR section. Their Exec Board for '69 includes Bob Mullane, NAR #4157 as president, and Karl Feldman, NAR #1136, treasurer. Temporarily, PVS will operate without a VP or secretary (until qualified members are recognized and tabbed).

Some of the benefits PVS members say they hope to gain include: 1) low annual dues, 2) use of a central launching site, 3) quantity purchase discounts, 4) more competition, and 5) exchange of materials and instructors for classes and projects.

"Individual members who live quite distant from any of the districts are being encouraged to form a new district in their local area with aid from PVS," explained President Mullane. He named the district presidents and encouraged local rocketeers to contact them: Robert J. Mullane, 34 Sixth St., Harrison, N.J. 07029; William Conrad III, 42 Dorset Dr., Kenilworth, N.J. 07033; Gary Lindgren, 15 Hunter Ave., Fanwood, N.J. 07023; Mark Wargo, 954 River Rd., Piscataway, N.J. 08854.

IT BURSTS FROM THE PAD

Does your section have the common problem of finding out about what another section across the nation has accomplished six months ago? Are you missing out on their plans for new birds, equipment, and activities? Why not exchange section newsletters, etc.? Most charge for postage; some will exchange info for free (see the May issue for addresses).

NAR Orbiters in Rochester, N.Y. 14609, at 86 Tottenham Rd. (new address), have finished a new launch system which is compact, fully portable, etc. It features six launchers on a rack and facilities for 3 additional tilt-a-pad launchers for spot landing contests. Orbiters say they can use any combination of launchers at any one time. Maybe they will haul it out to Colorado the second week of August? Officers of the section are Harry Parker, president; Dick Hammond, VP; Robert Staehle, treasurer; and secretary, Dana Schwartz. . . . Birch Lane Section has competed with rival Dixon Haven Hitters in Calif. several times recently . . . so far it sounds close to a draw, rocket for rocket in the quest for contest points in NAR. . . . Glen Ellyn Rocket Research Society in Ill. reports a revision of their constitution in line with NAR and continued enjoyment of NASA films at all meetings.

Metro-Denver Rocket Assn. now has 31 members registered with NAR since emphasis

Continued on page 72



IMAGINE! UNDER \$10
for this new size "Best Seller"

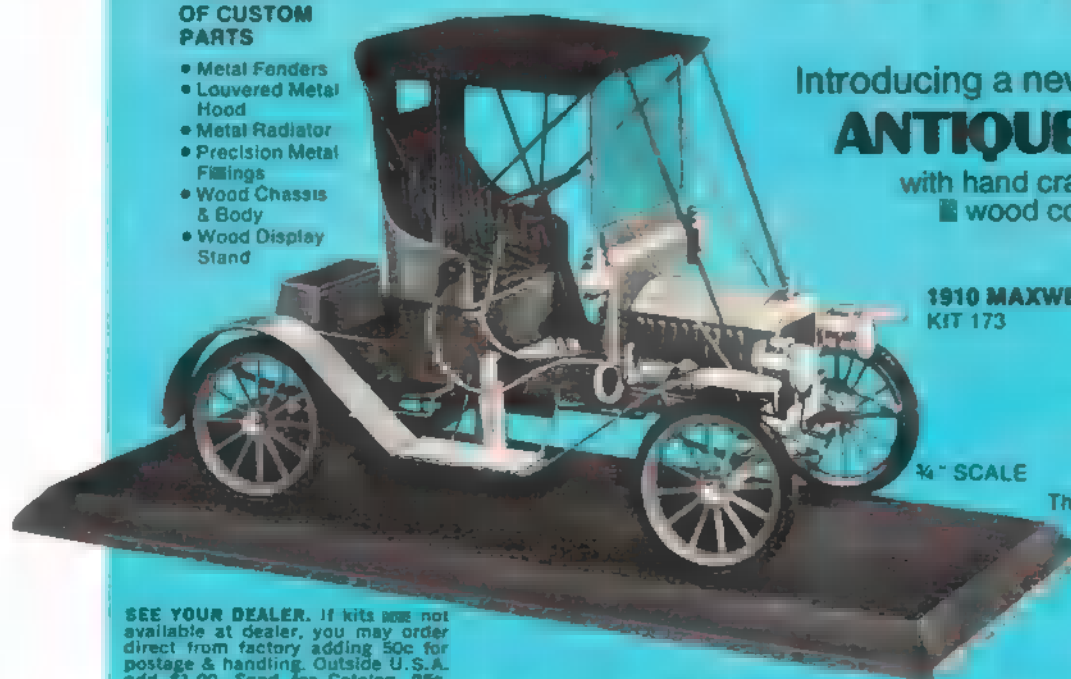
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UNIQUE NEW WOOD 'N' METAL MODELS

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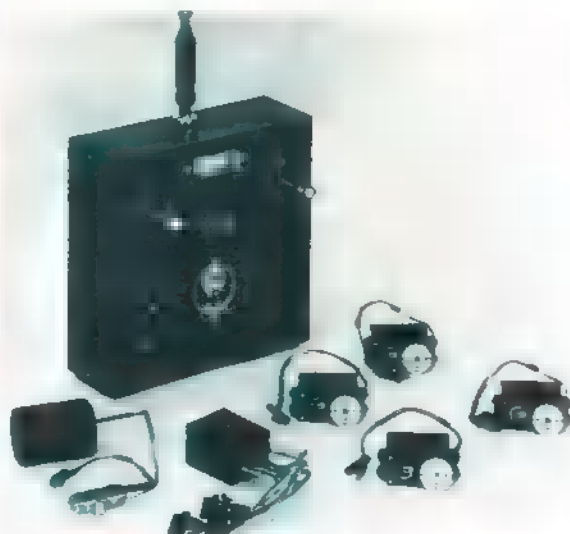
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AIRTROL'S DIGITAL MP-1

(Mini-Propo-4 Channel Digital System)

Offers 4 functions. Freq. 27 m.c. Transmitter delivers power to keep control of your plane out of sight and back again. The control functions come from two precision built control sticks with each function trimmable. The transmitter has the charger built-in and charges its own batteries as well as the airborne pack at the same time. The receiver is a very small package and with great sensitivity the latest solid state switching to give the best possible reliability available. The 4 servos are the smallest design with extremely fast resolution and positive positioning. Leather grain finished cases. Wt. (airborne equip.) 14 ozs.

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Complete

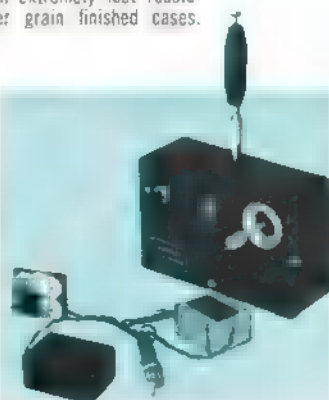
AIRTROL'S GL-100

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Finest available. Ideal for the beginner. Simplest smoothest ghost actuator. 3 functions—rudder, elevator and motor control. 27 m.c. freq. Superhet receiver. No wiring necessary. 56" center antenna. Wt. (airborne equip.) 8 ozs.

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Complete



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All the finish hardware needed to complete your Airtrol R/C plane. Each kit contains 1 fuel tank; 2 push rod assemblies including dowels, wire rods, keeper wires, heat shrink tubes, Kwik-Links, copper wire and solder; 1 motor mount; 2 control horns; 1 wheel collars; 6 rubber bands; wheels*.

EACH
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3 DIFFERENT PACKAGES

PK-I (for Cessna 150 K) "Contains 1 pair 2" wheels; 1-1 1/4" wheel.

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THESE PARTS PACKAGES ARE MADE SPECIFICALLY FOR AIRTROL KITS BUT CAN BE EASILY ADAPTED TO OTHER PLANES OF SIMILAR CONFIGURATION AND ENGINE SIZE (.10-.15).

ALBATROS AB/RF-1
44" wing span. Wt. 2 1/2 lbs.

"115"
complete



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42" wing span. Wt. 2 1/2 lbs.

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4 READY-TO-FLY PLANES

complete with
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Vacuum-formed high-impact
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44" wing span. Wt. 2 1/2 lbs.

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44" wing span. Wt. 2 1/2 lbs.

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ATTENTION! New prices on above planes in kit form (planes only) Morane-Saulnier MS-1 \$17.50; Albatros AB-1 \$18.95; Cessna 150K \$15.95; Messerschmitt ME-109 \$17.50. Watch for new J3 CUB and Foam Sailplane.

If your dealer cannot supply you—order direct—

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GETTING STARTED IN R/C

What to do if your equipment quits—before you return it to the manufacturer.

HOWARD MC ENTÉE

THIS sounds something like "What to do before the doctor comes?" Before you send ailing R/C equipment to the "doctor," there are a few simple checks you can make that might cure the problem, saving you money and reducing the time you might be grounded while doc puzzles over your problem.

First, what's the main trouble? If, for example, none of your servos will work, the fault is very likely not with the servos but with transmitter, receiver, batteries, or wiring. If all operation is erratic, the same components could be at fault. If just one servo is acting up, try it in substitution for one which works. Vice versa, try a good servo, plugged in, in place of the faulty one. If this shows the one servo itself is guilty, wiggle its leads and the connector. If you can't isolate the fault here, better return just that servo to the maker for check.

Many transmitters today, even single-channel types, have a test meter on the front. On some this merely indicates battery voltage. On others it shows RF output. In either case, you should have a good idea if it is showing the normal reading. If the transmitter is possibly at fault, are you sure the batteries are charged, or up to snuff, if of the dry variety? If dry, substitute a known good battery and check results. Most nickel-cad chargers have built-in lamp indicators to tell you if they are actually charging. With most, if the lamp is lit, they are putting power into the battery pack. Does the lamp light about the same as usual? Either a brighter or dimmer lamp could indicate trouble with the charger, or the battery pack.

When we get to the receiver we must ask did your problems come from sticking the plane into the ground due to pilot error? We stress pilot error here. If the crash was due to one of those mysterious troubles that you just can't spot, better send the works back for a checkup. But if you know you goofed on the controls, after you picked up the wreckage (even though the equipment looks undamaged), and after you have checked for the obvious broken or loose wires connecting battery pack, switch, and receiver, you might take the receiver cover off and listen carefully while you shake it. A broken crystal is sometimes the fault, and you can often hear the pieces rattle in the tiny case.

Back to the transmitter for a moment. If you can locate a field-strength meter or a monitor among your flying buddies, you can check for RF output, and for proper pulsing or proper tone output. Since transmitters don't take the beating that equipment in the plane does, they are not subject to heavy vibration, to occasional "hard landings" (another term for a semi-crash!), and they are generally made with larger and more rugged components. They aren't as apt to cause sudden trouble as plane components. But even the best of parts go sour. If your system, or your transmitter,

quits, try a spare crystal, even if of slightly different frequency from the one you normally use (if frequency differs, a superhet would not work with the transmitter, of course). Most any crystal in the 27 MHz spots will give transmitter output without retuning. On 72 or 76 the R/C spots are much further apart, and crystals on widely separated spots might not work without transmitter retune.

If your receiver has a relay, and this clicks in response to transmitter signals, but there is no action in escapement, actuator, or servo, you might just have dirt in the contacts. Pull a narrow strip of clean white paper (writing paper is good) through the contacts and try again. Try moving the relay armature with your finger to see if you can produce control action.

On the simpler types of control systems, look for binding linkage, jammed servo gears, and always for a broken wire. If you do find the problem, should you try to fix it? A broken lead might be the fault, and if you know how to solder, do the job, as long as the lead isn't in a critical position. But if it's somewhere deep in the receiver, better look at your warranty, for such repair work could void it on the claim you were "tampering" with the equipment.

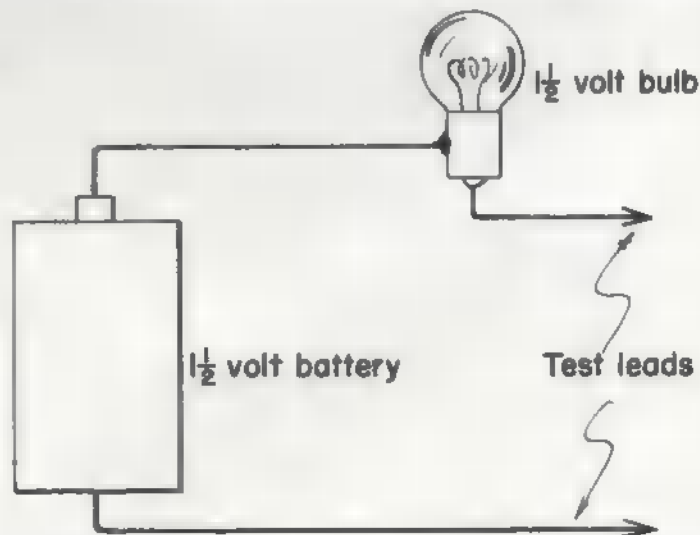
On less critical components, especially those you have had to supply, you can make your own repairs. Switches come in this class, and they often are points of trouble. If they have dirty contacts you can often produce partial operation by wiggling the

leads, lugs, or the knob. Or check them with a single cell in series with a flashlight bulb (use an ohmmeter, if you have one). If in any doubt, better replace the switch.

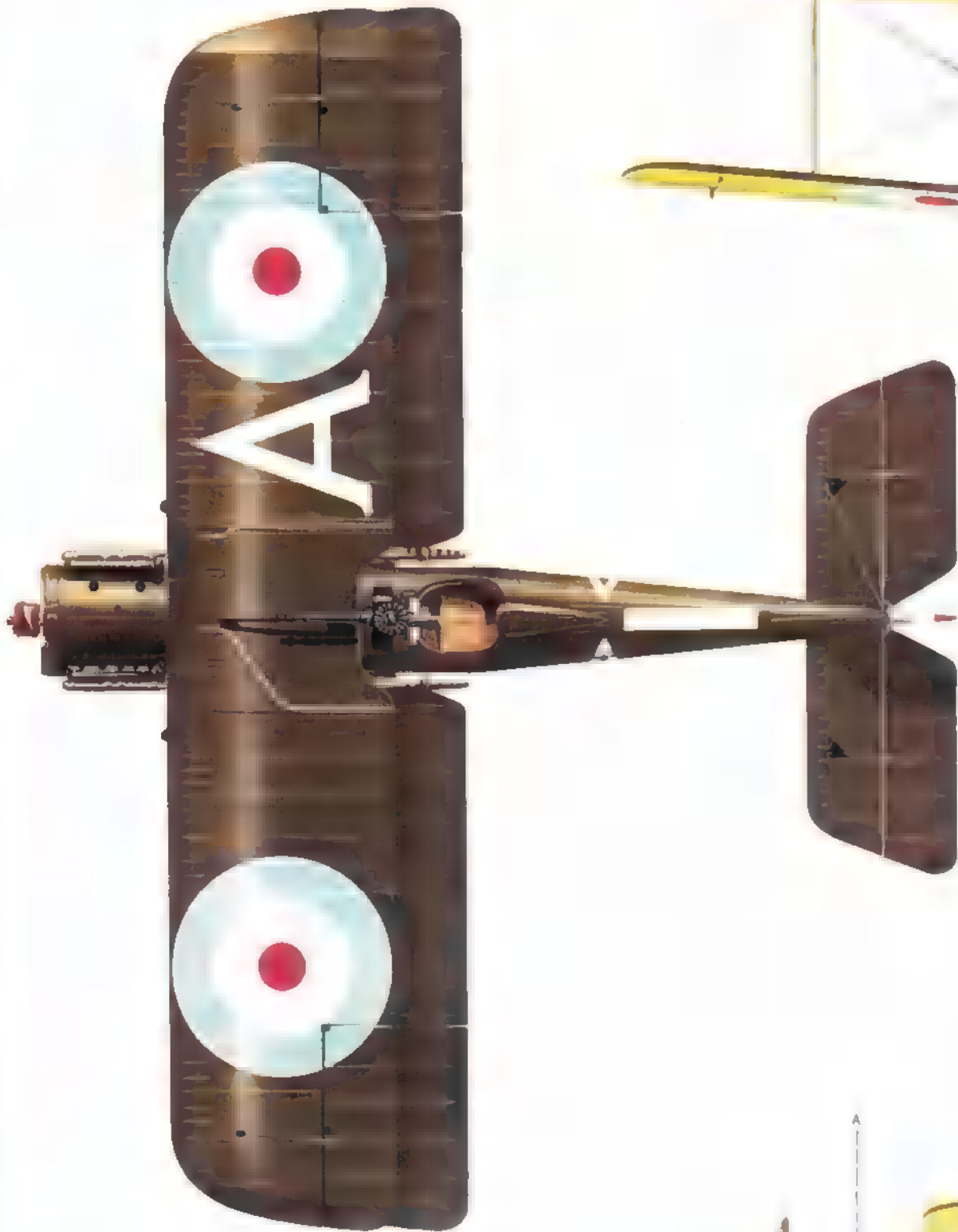
Does your system use battery boxes or holders? Another possible source of woe! Look for dirty or corroded contacts. Does the holder put plenty of endwise pressure on the cells? Dead cells left in a holder will often badly corrode the terminals. Scrape such points well, clean with a small wire brush, put on a bit of vaseline to prevent new corrosion at the same point.

If you can't find the trouble, and decide to send the rig back to the maker, you may not have to send the entire outfit. If no servos work, these components are probably not at fault and don't have to be returned (unless you want them checked for crash damage). But generally you should send transmitter and receiver together, along with their battery packs. Don't send dry batteries; they are costly to ship, and you should have checked to make sure such batteries aren't at fault. Pack well; include a clear description of your troubles.

Trouble-shooting is a real art. You can't do much without the proper tools, test equipment, and knowledge of how to use it. We've covered just a few highlights here, based to considerable extent on words of wisdom on this subject from Dave Gray (Airtrol of Adrian). We agree with Dave. Look for the simple and obvious faults, but don't get in over your head! Let a qualified Doctor handle the real tough problems!



To find a broken lead or bad plug connection, which might be the cause of your equipment failure, use this simple tester. Put a test lead on a battery terminal and with the other test lead trace the battery wire through the switch to servos and receiver.



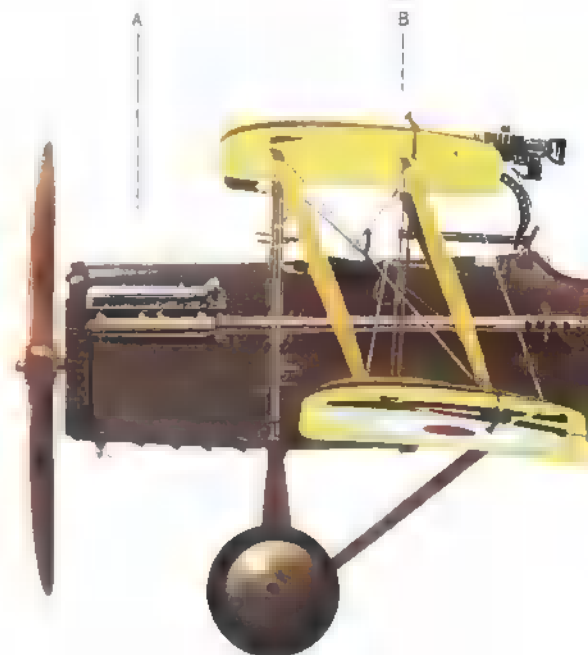
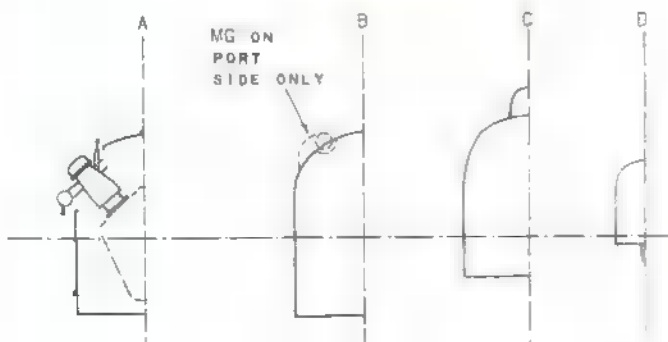
American Aircraft Model

S.E. 5

Capt. Edward "Mick" M
particular British machine
speed: 120 mph. One fixe
.303 Lewis machine gun o



TYPICAL AIRFOIL

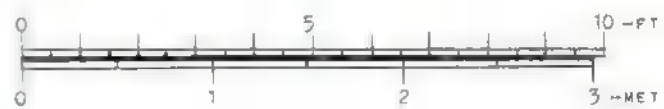
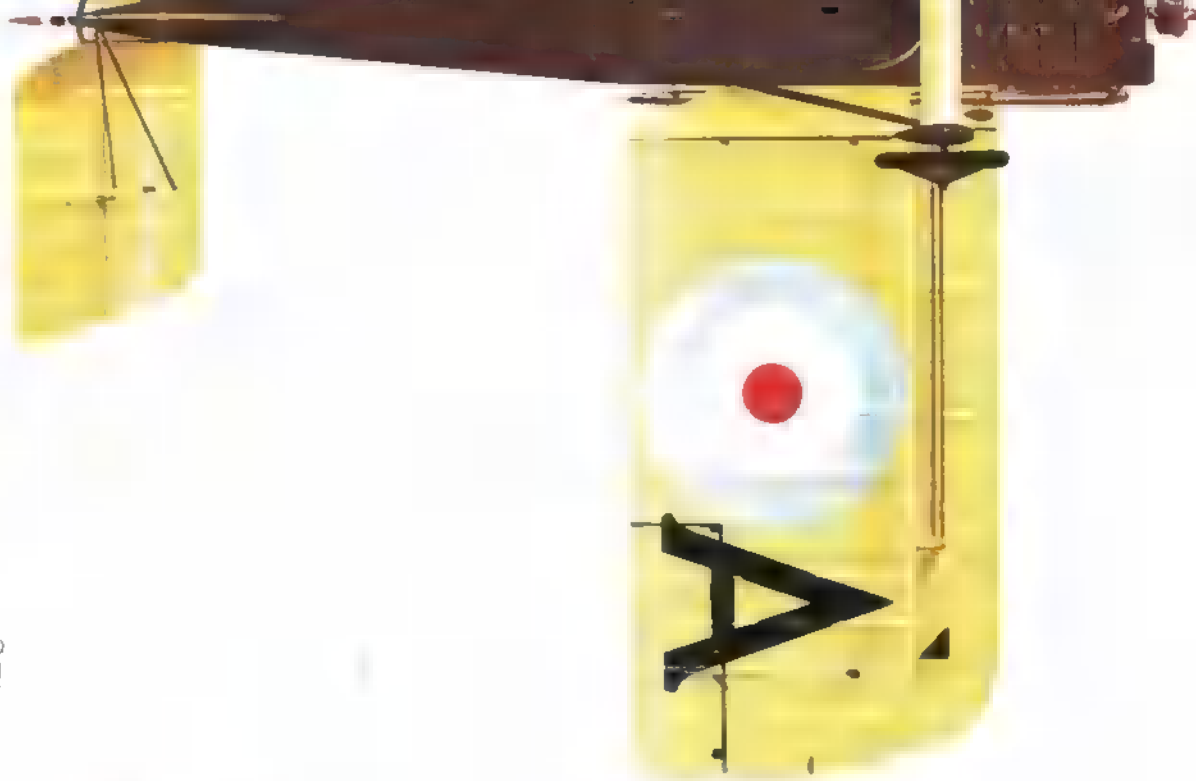




bum of all-time favorites:

(1918)

ock (73 victories) flew this
00-hp Wolseley Viper. Top
3 Vickers, plus one drum-fed
ster mounting.



Edmund Kelly



3/4" EACH WING TIP

WING DIHEDRAL

24 GA. SPEAKER CABLE

1/8 SHT. TIPS

1/4 SQ. LEADING EDGE

1/8 x 1/4 SPAR

CONTROL LINE GUIDE

SOLDER

TIP CLIPS

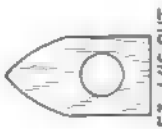
1/32 BRASS WIRE



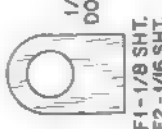
F5 - 1/16 SHT.



F4 - 1/16 SHT.



F3 - 1/16 SHT.



F1 - 1/8 SHT.
F2 - 1/16 SHT.



HATCH FORMER
1/8 SHT.
2 REQ'D.

NO. 10 MACH. SCREW
DRILL LENGTH-
WISE &
SOLDER TO
SHAFT

BALSA SPINNER

MABUCHI FT-36
RACE CAR
MOTOR

SPICE MOTOR
LEADS TO
WING WIRES

1/4 SHT.

3/8 D WHEELS

1/16 SHT. RUDDER

CELLULOID WINDSCREEN

CARVE FROM RIGID
URETHANE FOAM

1/32 SHT.

CONTROL LINE-NYLON
CORD

1/2 D WHEEL

1/32 SHT.

HINGE TOGETHER
WITH 1/2 WIDE
SILKSPAN
(TOP ONLY)

CONTROL LINE HOOK
NOTCH
L.W. ONLY

1/16 MAIN RIB - 10 REQ'D.

1/16 TIP RIB - 2 REQ'D.

1/8 SHELF

RETAINER
BLOCKS

1/8 SHT.
DOUBLERS

HOLD DOWN
HOOK - 4 REQ'D.

CONTROL GUIDE

CONTROL LINE

HOLE FOR
CONTROL LINE

LEAVE OPEN

NOTE:
WEIGHT
PYLON
HEAVILY

1/16 SHT. STABILIZER
& ELEVATOR

1/16 SHT. RUDDER

CELLULOID WINDSCREEN

CARVE FROM RIGID
URETHANE FOAM

1/32 SHT.

CONTROL LINE-NYLON
CORD

1/2 D WHEEL

1/32 SHT.

1/16 SHT. FUSELAGE
SIDES

1/16 SHT. RUDDER

CELLULOID WINDSCREEN

CARVE FROM RIGID
URETHANE FOAM

1/32 SHT.

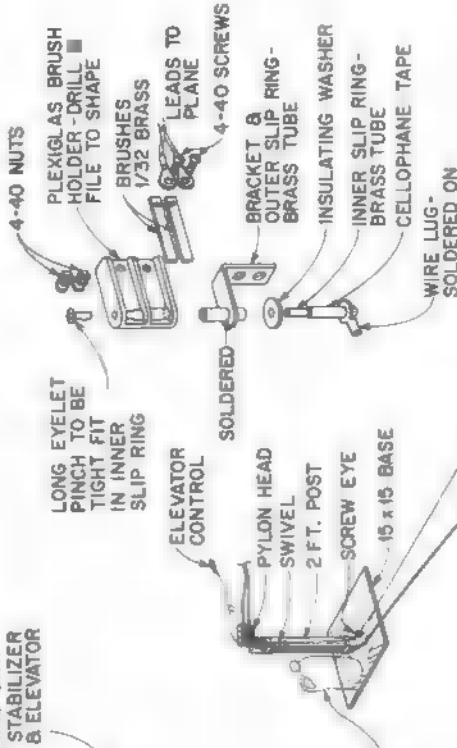
CONTROL LINE-NYLON
CORD

1/2 D WHEEL

1/32 SHT.

1/16 SHT. FUSELAGE
SIDES

1/16 SHT. RUDDER



4-40 NUTS

PLEXIGLAS BRUSH
HOLDER-DRILL
FILE TO SHAPE

BRUSHES
1/32 BRASS

LEADS TO
PLANE

4-40 SCREWS

BRACKET &
OUTER SLIP RING-
BRASS TUBE

INSULATING WASHER

INNER SLIP RING-
BRASS TUBE

CELLOPHANE TAPE

WIRE LUG-
SOLDERED ON

CONTROL LINE
HOLD DOWN
(OUTSIDE CIRCLE)

POWER PACK
(OUTSIDE CIRCLE)

THRUSTLE

15 x 15 BASE

SCREW EYE

2 FT. POST

PYLON HEAD
SWIVEL

ELEVATOR
CONTROL

SOLDERED

LONG EYELET
PINCH TO BE
TIGHT FIT
IN INNER
SLIP RING

1/16 SHT. STABILIZER
& ELEVATOR

1/16 SHT. RUDDER

CELLULOID WINDSCREEN

CARVE FROM RIGID
URETHANE FOAM

1/32 SHT.

CONTROL LINE-NYLON
CORD

1/2 D WHEEL

1/32 SHT.

1/16 SHT. FUSELAGE
SIDES

1/16 SHT. RUDDER

ELECTRIC POWERED
CONTROL LINE SPORTSTER

VOLTSWAGON

DESIGNED BY PAT MARCH
DRAWN BY FRANK PRZYBYLSKI



Tether head as described is easily built using a piece of Plexiglas shaped by hand drill and file. String is elevator control.

All kinds of planes can be tether flown with electric motors. This is an ideal trainer. Gentle responses but rugged.

Voltswagon

Electric indoor tether flying with slot motors and light balsa planes

is ideal club-oriented activity. Elevator and motor control are used.

PAT MARCH

PHOTOS BY ART KING

FLYING powered models becomes more difficult with vanishing flying sites and complaints about noise. Voltswagon solves these problems as well — offering complete throttle and elevator control, ability to fly indoors or out, and no starting problem. The modern slot racing motor makes this possible.

I have built electric-powered pylon models with wing spans from 4 to 25", with areas up to 150 sq. in. Larger wing areas make for remarkable maneuverability. Speedsters using hefty motors and small, high-pitched props have logged speeds of over 40 mph. These models are flown on a tether from a pylon, with power brought out from the pylon head through slip-rings.

A single light cord concentric with the slip-rings serves to operate the elevators. Up-elevator only is used, since down-elevator turned out to be a disaster.

Voltswagon is an ideal introduction to the field of electric flying. It is docile — the controls, yet has good maneuverability and speed. It lends itself well to experiments with Payload, Speed, Carrier, and other such events as may be dreamed up. It is also useful as a primary trainer for U-Control.

You must first obtain a suitable power-pack. Fourteen volts — 2½ amperes was needed to match the full capabilities of the motor used. It is suggested that you go first class on power-packs because you will wish to make other, more demanding electro-

planes after experimenting with Voltswagon. Perhaps your club could be persuaded to purchase a suitable industrial power supply that will give plenty of capacity for future needs. A slot-racing throttle regulates power to the motor. The "brake" feature on these units is undesirable and should be left disconnected.

A 12-volt automobile battery also is suitable. There is plenty of emperage and long life between charges. When discharged you can have it recharged at a gas station. A second-hand or reconditioned battery is fine. The voltage will be adequate but, if your motors demand more voltage, a 6-volt battery can be used in series with the 12-

Continued on page 67



Author and members of Tri-County Model Club show off their many planes. Events include Speed, Carrier, Scale and Payload.



Engine sits on 1/8th-in. balsa floor held down by rubber band. Cooling air passes through motor and out through fuselage.

SIG FIRST IN BALSA AND MODEL SUPPLIES

Two more superb SIG Superkits - for your '69 contest and sport flying

DOUBLER Basic streamlined new R/C Sport design is perfect for either Glidering or Sport. Proportional, Multi-configuration, Improved King Quarter-Middle Racer. Features: die-cast grade AAAA Balsa and Plywood, Molded Canopy, Color Details, Formed Landing Gear and Super Detailed Plans. Sporting a compact 17-1/2" 2" this little beauty takes 100 engine. Only \$9.95

YAK-18 Claude MacDougal's fabulous exacting replica of this world-famous aerobatic plane will complete the R/C Scale Internats in Germany this year. Sig's superb YAK-18 will be available at dealers soon after this ad appears. Sporting 72-1/2" 2", for 60 engines, the kit features 7" 8" Aileron, Cowling, 1040" Molded Canopy, Formed Landing Gear, Color Details, plus THREE sheets of Highly Detailed Plans (containing ample scale presentation material) on fuselage ship. \$45.95



AAA BALSA - PRICE LIST

SHEETS		STRIPS		BLOCKS	
LENGTHS		LENGTHS		LENGTHS	
1/2" x 3/16"	276	1/2" x 3/16"	36	1" x 1/2"	66
1/2" x 1/8"	286	1/2" x 1/8"	36	1" x 3/4"	76
1/2" x 3/32"	306	1/2" x 3/32"	36	2" x 2"	146
1/2" x 1/4"	316	1/2" x 1/4"	36	2" x 3"	156
1/2" x 5/32"	326	1/2" x 5/32"	36	2" x 4"	166
1/2" x 3/16"	336	1/2" x 3/16"	36	2" x 5"	176
1/2" x 1/2"	346	1/2" x 1/2"	36	2" x 6"	186
1/2" x 5/8"	356	1/2" x 5/8"	36	2" x 7"	196
1/2" x 3/4"	366	1/2" x 3/4"	36	2" x 8"	206
1/2" x 7/8"	376	1/2" x 7/8"	36	2" x 9"	216
1/2" x 1"	386	1/2" x 1"	36	2" x 10"	226
1/2" x 1 1/8"	396	1/2" x 1 1/8"	36	2" x 11"	236
1/2" x 1 1/4"	406	1/2" x 1 1/4"	36	2" x 12"	246
1/2" x 1 1/2"	416	1/2" x 1 1/2"	36	2" x 13"	256
1/2" x 1 3/4"	426	1/2" x 1 3/4"	36	2" x 14"	266
1/2" x 1 7/8"	436	1/2" x 1 7/8"	36	2" x 15"	276
1/2" x 2"	446	1/2" x 2"	36	2" x 16"	286
1/2" x 2 1/8"	456	1/2" x 2 1/8"	36	2" x 17"	296
1/2" x 2 1/4"	466	1/2" x 2 1/4"	36	2" x 18"	306
1/2" x 2 1/2"	476	1/2" x 2 1/2"	36	2" x 19"	316
1/2" x 2 3/4"	486	1/2" x 2 3/4"	36	2" x 20"	326
1/2" x 2 7/8"	496	1/2" x 2 7/8"	36	2" x 21"	336
1/2" x 3"	506	1/2" x 3"	36	2" x 22"	346
1/2" x 3 1/8"	516	1/2" x 3 1/8"	36	2" x 23"	356
1/2" x 3 1/4"	526	1/2" x 3 1/4"	36	2" x 24"	366
1/2" x 3 1/2"	536	1/2" x 3 1/2"	36	2" x 25"	376
1/2" x 3 3/4"	546	1/2" x 3 3/4"	36	2" x 26"	386
1/2" x 3 7/8"	556	1/2" x 3 7/8"	36	2" x 27"	396
1/2" x 4"	566	1/2" x 4"	36	2" x 28"	406
1/2" x 4 1/8"	576	1/2" x 4 1/8"	36	2" x 29"	416
1/2" x 4 1/4"	586	1/2" x 4 1/4"	36	2" x 30"	426
1/2" x 4 1/2"	596	1/2" x 4 1/2"	36	2" x 31"	436
1/2" x 4 3/4"	606	1/2" x 4 3/4"	36	2" x 32"	446
1/2" x 4 7/8"	616	1/2" x 4 7/8"	36	2" x 33"	456
1/2" x 5"	626	1/2" x 5"	36	2" x 34"	466
1/2" x 5 1/8"	636	1/2" x 5 1/8"	36	2" x 35"	476
1/2" x 5 1/4"	646	1/2" x 5 1/4"	36	2" x 36"	486
1/2" x 5 1/2"	656	1/2" x 5 1/2"	36	2" x 37"	496
1/2" x 5 3/4"	666	1/2" x 5 3/4"	36	2" x 38"	506
1/2" x 5 7/8"	676	1/2" x 5 7/8"	36	2" x 39"	516
1/2" x 6"	686	1/2" x 6"	36	2" x 40"	526
1/2" x 6 1/8"	696	1/2" x 6 1/8"	36	2" x 41"	536
1/2" x 6 1/4"	706	1/2" x 6 1/4"	36	2" x 42"	546
1/2" x 6 1/2"	716	1/2" x 6 1/2"	36	2" x 43"	556
1/2" x 6 3/4"	726	1/2" x 6 3/4"	36	2" x 44"	566
1/2" x 6 7/8"	736	1/2" x 6 7/8"	36	2" x 45"	576
1/2" x 7"	746	1/2" x 7"	36	2" x 46"	586
1/2" x 7 1/8"	756	1/2" x 7 1/8"	36	2" x 47"	596
1/2" x 7 1/4"	766	1/2" x 7 1/4"	36	2" x 48"	606
1/2" x 7 1/2"	776	1/2" x 7 1/2"	36	2" x 49"	616
1/2" x 7 3/4"	786	1/2" x 7 3/4"	36	2" x 50"	626
1/2" x 7 7/8"	796	1/2" x 7 7/8"	36	2" x 51"	636
1/2" x 8"	806	1/2" x 8"	36	2" x 52"	646
1/2" x 8 1/8"	816	1/2" x 8 1/8"	36	2" x 53"	656
1/2" x 8 1/4"	826	1/2" x 8 1/4"	36	2" x 54"	666
1/2" x 8 1/2"	836	1/2" x 8 1/2"	36	2" x 55"	676
1/2" x 8 3/4"	846	1/2" x 8 3/4"	36	2" x 56"	686
1/2" x 8 7/8"	856	1/2" x 8 7/8"	36	2" x 57"	696
1/2" x 9"	866	1/2" x 9"	36	2" x 58"	706
1/2" x 9 1/8"	876	1/2" x 9 1/8"	36	2" x 59"	716
1/2" x 9 1/4"	886	1/2" x 9 1/4"	36	2" x 60"	726
1/2" x 9 1/2"	896	1/2" x 9 1/2"	36	2" x 61"	736
1/2" x 9 3/4"	906	1/2" x 9 3/4"	36	2" x 62"	746
1/2" x 9 7/8"	916	1/2" x 9 7/8"	36	2" x 63"	756
1/2" x 10"	926	1/2" x 10"	36	2" x 64"	766
1/2" x 10 1/8"	936	1/2" x 10 1/8"	36	2" x 65"	776
1/2" x 10 1/4"	946	1/2" x 10 1/4"	36	2" x 66"	786
1/2" x 10 1/2"	956	1/2" x 10 1/2"	36	2" x 67"	796
1/2" x 10 3/4"	966	1/2" x 10 3/4"	36	2" x 68"	806
1/2" x 10 7/8"	976	1/2" x 10 7/8"	36	2" x 69"	816
1/2" x 11"	986	1/2" x 11"	36	2" x 70"	826
1/2" x 11 1/8"	996	1/2" x 11 1/8"	36	2" x 71"	836
1/2" x 11 1/4"	1006	1/2" x 11 1/4"	36	2" x 72"	846
1/2" x 11 1/2"	1016	1/2" x 11 1/2"	36	2" x 73"	856
1/2" x 11 3/4"	1026	1/2" x 11 3/4"	36	2" x 74"	866
1/2" x 11 7/8"	1036	1/2" x 11 7/8"	36	2" x 75"	876
1/2" x 12"	1046	1/2" x 12"	36	2" x 76"	886
1/2" x 12 1/8"	1056	1/2" x 12 1/8"	36	2" x 77"	896
1/2" x 12 1/4"	1066	1/2" x 12 1/4"	36	2" x 78"	906
1/2" x 12 1/2"	1076	1/2" x 12 1/2"	36	2" x 79"	916
1/2" x 12 3/4"	1086	1/2" x 12 3/4"	36	2" x 80"	926
1/2" x 12 7/8"	1096	1/2" x 12 7/8"	36	2" x 81"	936
1/2" x 13"	1106	1/2" x 13"	36	2" x 82"	946
1/2" x 13 1/8"	1116	1/2" x 13 1/8"	36	2" x 83"	956
1/2" x 13 1/4"	1126	1/2" x 13 1/4"	36	2" x 84"	966
1/2" x 13 1/2"	1136	1/2" x 13 1/2"	36	2" x 85"	976
1/2" x 13 3/4"	1146	1/2" x 13 3/4"	36	2" x 86"	986
1/2" x 13 7/8"	1156	1/2" x 13 7/8"	36	2" x 87"	996
1/2" x 14"	1166	1/2" x 14"	36	2" x 88"	1006
1/2" x 14 1/8"	1176	1/2" x 14 1/8"	36	2" x 89"	1016
1/2" x 14 1/4"	1186	1/2" x 14 1/4"	36	2" x 90"	1026
1/2" x 14 1/2"	1196	1/2" x 14 1/2"	36	2" x 91"	1036
1/2" x 14 3/4"	1206	1/2" x 14 3/4"	36	2" x 92"	1046
1/2" x 14 7/8"	1216	1/2" x 14 7/8"	36	2" x 93"	1056
1/2" x 15"	1226	1/2" x 15"	36	2" x 94"	1066
1/2" x 15 1/8"	1236	1/2" x 15 1/8"	36	2" x 95"	1076
1/2" x 15 1/4"	1246	1/2" x 15 1/4"	36	2" x 96"	1086
1/2" x 15 1/2"	1256	1/2" x 15 1/2"	36	2" x 97"	1096
1/2" x 15 3/4"	1266	1/2" x 15 3/4"	36	2" x 98"	1106
1/2" x 15 7/8"	1276	1/2" x 15 7/8"	36	2" x 99"	1116
1/2" x 16"	1286	1/2" x 16"	36	2" x 100"	1126
1/2" x 16 1/8"	1296	1/2" x 16 1/8"	36	2" x 101"	1136
1/2" x 16 1/4"	1306	1/2" x 16 1/4"	36	2" x 102"	1146
1/2" x 16 1/2"	1316	1/2" x 16 1/2"	36	2" x 103"	1156
1/2" x 16 3/4"	1326	1/2" x 16 3/4"	36	2" x 104"	1166
1/2" x 16 7/8"	1336	1/2" x 16 7/8"	36	2" x 105"	1176
1/2" x 17"	1346	1/2" x 17"	36	2" x 106"	1186
1/2" x 17 1/8"	1356	1/2" x 17 1/8"	36	2" x 107"	1196
1/2" x 17 1/4"	1366	1/2" x 17 1/4"	36	2" x 108"	1206
1/2" x 17 1/2"	1376	1/2" x 17 1/2"	36	2" x 109"	1216
1/2" x 17 3/4"	1386	1/2" x 17 3/4"	36	2" x 110"	1226
1/2" x 17 7/8"	1396	1/2" x 17 7/8"	36	2" x 111"	1236
1/2" x 18"	1406	1/2" x 18"	36	2" x 112"	1246
1/2" x 18 1/8"	1416	1/2" x 18 1/8"	36	2" x 113"	1256
1/2" x 18 1/4"	1426	1/2" x 18 1/4"	36	2" x 114"	1266
1/2" x 18 1/2"	1436	1/2" x 18 1/2"	36	2" x 115"	1276
1/2" x 18 3/4"	1446	1/2" x 18 3/4"	36	2" x 116"	1286
1/2" x 18 7/8"	1456	1/2" x 18 7/8"	36	2" x 117"	1296
1/2" x 19"	1466	1/2" x 19"	36	2" x 118"	1306
1/2" x 19 1/8"	1476	1/2" x 19 1/8"	36	2" x 119"	1316
1/2" x 19 1/4"	1486	1/2" x 19 1/4"	36	2" x 120"	1326
1/2" x 19 1/2"	1496	1/2" x 19 1/2"	36	2" x 121"	1336
1/2" x 19 3/4"	1506	1/2" x 19 3/4"	36	2" x 122"	1346
1/2" x 19 7/8"	1516	1/2" x 19 7/8"	36	2" x 123"	1356
1/2" x 20"	1526	1/2" x 20"	36	2" x 124"	1366
1/2" x 20 1/8"	1536	1/2" x 20 1/8"	36	2" x 125"	1376
1/2" x 20 1/4"	1546	1/2" x 20 1/4"	36	2" x 126"	1386
1/2" x 20 1/2"	1556	1/2" x 20 1/2"	36	2" x 127"	1396
1/2" x 20 3/4"	1566	1/2" x 20 3/4"	36	2" x 128"	1406
1/2" x 20 7/8"	1576	1/2" x 20 7/8"	36	2" x 129"	1416
1/2" x 21"	1586	1/2" x 21"	36	2" x 130"	1426
1/2" x 21 1/8"	1596	1/2" x 21 1/8"	36	2" x 131"	1436
1/2" x 21 1/4"	1606	1/2" x 21 1/4"	36	2" x 132"	1446
1/2" x 21 1/2"	1616	1/2" x 21 1/2"	36	2" x 133"	1456
1/2" x 21 3/4"	1626	1/2" x 21 3/4"	36	2" x 134"	1466
1/2" x 21 7/8"	1636	1/2" x 21 7/8"	36	2" x 135"	1476
1/2" x 22"	1646	1/2" x 22"	36	2" x 136"	1486
1/2" x 22 1/8"	1656	1/2" x 22 1/8"	36	2" x 137"	1496
1/2" x 22 1/4"	1666	1/2" x 22 1/4"	36	2" x 138"	1506
1/2" x 22 1/2"	1676	1/2" x 22 1/2"	36	2" x 139"	1516
1/2" x 22 3/4"	1686	1/2" x 22 3/4"	36	2" x 140"	1526
1/2" x 22 7/8"	1696	1/2" x 22 7/8"	36	2" x 141"	1536
1/2" x 23"	1706	1/2" x 23"	36	2" x 142"	1546
1/2" x 23 1/8"	1716	1/2" x 23 1/8"	36	2" x 143"	1556
1/2" x 23 1/4"	1726	1/2" x 23 1/4"	36	2" x 144"	1566
1/2" x 23 1/2"	1736	1/2" x 23 1/2"	36	2" x 145"	1576
1/2" x 23 3/4"	1746	1/2" x 23 3/4"	36	2" x 146"	1586
1/2" x 23 7/8"	1756	1/2" x 23 7/8"	36	2" x 147"	1596
1/2" x 24"	1766	1/2" x 24"	36	2" x 148"	1606
1/2" x 24 1/8"	1776	1/2" x 24 1/8"	36	2" x 149"	1616
1/2" x 24 1/4"	1786	1/2" x 24 1/4"	36	2" x 150"	1626
1/2" x 24 1/2"	1796	1/2" x 24 1/2"	36	2" x 151"	1636
1/2" x 24 3/4"	1806	1/2" x 24 3/4"	36	2" x 152"	1646
1/2" x 24 7/8"	1816	1/2" x 24 7/8"	36	2" x 153"	1656
1/2" x 25"	1826	1/2" x 25"	36	2" x 154"	1666
1/2" x 25 1/8"	1836	1/2" x 25 1/8"	36	2" x 155"	1676
1/2" x 25 1/4"	1846	1/2" x 25 1/4"	36	2" x 156"	1686
1/2" x 25 1/2"	1856	1/2" x 25 1/2"	36	2" x 157"	1696
1/2" x 25 3/4"	1866	1/2" x 25 3/4"	36	2" x 158"	1706
1/2" x 25 7/8"	1876	1/2" x 25 7/8"	36	2" x 159"	1716
1/2" x 26"	1886	1/2" x 26"	36	2" x 160"	1726
1/2" x 26 1/8"	1896	1/2" x 26 1/8"	36	2" x 161"	1736
1/2" x 26 1/4"	1906	1/2" x 26 1/4"	36	2" x 162"	1746
1/2" x 26 1/2"	1916	1/2" x 26 1/2"	36	2" x 163"	1756
1/2" x 26 3/4"	1926	1/2" x 26 3/4"	36	2" x 164"	1766
1/2" x 26 7/8"	1936	1/2" x 26 7/8"	36	2" x 165"	1776
1/2" x 27"	1946	1/2" x 27"	36	2" x 166"	1786
1/2" x 27 1/8"	1956	1/2" x 27 1/8"	36	2" x 167"	1796
1/2" x 27 1/4"	1966	1/2" x 27 1/4"	36	2" x 168"	1806
1/2" x 27 1/2"	1976	1/2" x 27 1/2"	36	2" x 169"	1816
1/2" x 27 3/4"	1986	1/2" x 27 3/4"	36	2" x 170"	1826
1/2" x 27 7/8"	1996	1/2" x			



INTERESTED IN JOINING A.M.A.? Over 25,000 did in 1968. Membership details may be had by requesting FREE BROCHURE from above address.

AMA Helps Snoopy Get His Wings

Snoopy and the Red Baron have been dueling in the skies of comic strips for years, but only recently was it realized that Snoopy has been flying his doghouse without credentials—he never had officially won his wings. But Snoopy is a legitimate pilot now, thanks to Fred Williams of San Mateo, California.

Fred is a member of the Peninsula Channel Commanders, an AMA chartered club. He's also a member of the Navy League, a longtime aviation buff, and a patriot. Fred believes that individual can and should do his bit to make the world a better place to live in. He started with a simple idea that captured the imagination of everyone who heard it, soon involved hundreds of people, and got national attention.

The idea was to honor the old-time virtues which have gotten lost in a generation and communications gap: honor, integrity, bravery, patriotism. Fred felt these were still strong enough to bring people together from all walks of life, young and old alike. Everybody loved Snoopy, he felt, and his creator—Charles Schulz—lived nearby. Why not a ceremony to honor them for their contributions to those ideals?

One press release did the trick. In no time at all the whole country was involved and other AMA'ers joined with Fred to put the idea over. Another San Mateo modeler, Roger Tennyson, made the wings. Roger used his dentistry know-how and modeling techniques to design the wings and make a mold. He then cast and polished a magnificent set of genuine gold wings.

Al Signorino, of the McDonnell-Douglas RC Club of St. Louis, also joined the effort. Al brought his famous radio-controlled doghouse to fly for the California press and television people, and to prove that Snoopy's flying was no mere figment of Schulz' imagination—he also provided a good example of the ingenuity, skill and resourcefulness of model flyers.

AMA President John Patton supported the project by authorizing John Worth, the AMA executive director, to join the effort in person, to help make sure that modeling's contribution would be recognized. (As side projects Worth would also have AMA business meetings with the executive director of the National Free Flight Society, the secretary of the Western Associated Modelers, and representatives of the Air Force Association.)

It all came to a head on March 12. The wings presentation took place outdoors—the steps of the Hillsdale Inn in the late afternoon. About a thousand youngsters were on hand, as well as hundreds of adults representing almost every civic group and military installation in the area. The Navy's Blue Angels precision aerobatics team was

featured, as was singer Jimmy Dean. Schulz, Dean and the Blue Angels signed autographs, and the Hamilton Air Force Band provided martial music while a trio of Stearman biplanes roared overhead.

It was Memorial Day, July Fourth and Armistice Day all rolled into one, with speeches, flags and bunting. Most miraculous of all was the weather. Storms were all around the area all day, but for the two-hour afternoon program there was only sunshine at the Hillsdale.

It wasn't that way earlier. Signorino and Worth got Snoopy in the air during morning rains nearby San Carlos airport. Mud prevented use of the planned takeoff—they used a well-puddled parking lot adjacent to the operations building. They fought wet and weak batteries, strange fuel and shifty winds. But finally Al got Snoopy to fly for the press and tele-

vision cameras. Soaking wet, but triumphant, Signorino got Snoopy and his doghouse up and back to a pancake landing right in front of the cheering crowd. Worth then flew a tiny Fly-Navy AMA Cub which had a subminiature Snoopy aboard.

Much more went on, including cocktail parties that night and a banquet at which TV star Barbara "Jeanie" Eden signed autographs, topped off by a late news television bit showing Snoopy's earlier flying. It was a wild windup to a spectacular day in which Snoopy and AMA shared the spotlight.

The last we heard, Snoopy was gunning for the Red Baron again with a souped-up doghouse and a blinding flash of gold wings on his chest. If he hasn't crashed or retired by then, July 20 he'll be flying for the crowd again in the Nats air show at Willow Grove Naval Air Station.

Al Signorino photo



Elwing Studio photo

His Flying Doghouse famous to modelers Snoopy is to readers of Charles Schulz' comic strip, Al Signorino, starting engine, assisted with festivities when the Navy Blue Angels presented Snoopy's wings. Assisting Al is AMA Executive Director John Worth. Fred Williams, who put forward the idea, looks on. Inset shows the gold wings crafted by Roger Tennyson. The inscription reads, "Wings for Snoopy," presented Charles M. Schulz, San Mateo, Calif., March 12, 1969. Presented by Navy Blue Angels for Aviators Everywhere."

1968 Best Year Yet: AMA Financial Statement

Last year we passed a significant milestone in AMA's 33 year history — 1968 was the first year that income (and expenses) exceeded \$200,000! The big membership boom last year produced the milestone figures, and despite steadily rising costs of supplies and services in 1968, we fortunately managed to end up in the black.

Our operating income came out \$517 over expenses — close, but in the black. With the addition of "other income" (contributions and interest from savings accounts) the net profit was still greater — almost \$3,000. This means that all the "other income" went toward reducing our old deficit. For two years in a row, therefore, we have reduced the debt significantly — a total of \$5,500.

Some other highlights of the 1968 financial statement:

Model Aviation, our membership publication, totalled just over \$55,500. This included purchase cost of each copy, HQ salaries for production of material, postage, percentage of rent, telephone and other overhead. The cost would have been much higher had all members received every issue during the year, but the nature of the AMA membership is that many people join or renew well after the year begins — they paid the normal membership fee but got less service. The effect, because of a fixed allocation of magazine costs per member, was to reduce the average cost to all members.

The **National Model Airplane Championships** — as always — shows an apparently heavy loss. But the Nats expenses include slightly over \$10,000 in HQ salaries — almost exactly the amount of the loss. This means that aside from the HQ salary cost allotted to the Nats (most of which would go with or without the Nats) we came close to breaking even — about \$24,700 income versus about \$25,200 in other expenses.

Looking back, we have completed a five-year period of dramatic developments. In 1963 AMA was practically bankrupt. We barely squeaked by that year, without Executive Director and \$15,500 in debt, and about \$97,000 income. A dues increase in 1964 dropped membership from almost 20,000 to less than 17,000, but income went up to \$117,000. In 1965, we invested heavily in improved HQ services, and income went to over \$135,000, but costs increased the deficit again, to almost \$19,000. Finally, in 1966 — with a new club program and initiation of our commercial magazine arrangement — membership started up again. In 1967 we broke the previous 30-year membership record by going to almost 23,000 members; we topped that in 1968 by 3,000 more members than the year before — and in both years we operated in the black.

Now, in 1969, we look to another very successful year. Despite a hefty dues increase we are ahead of last year's renewal rate — over 23,000 already. We have matched last year's dues income and stand to increase it considerably since we have half of the year to go.

Indications are that we will match last year's membership total and considerably exceed 1968 income. On the other hand

expenses for 1969 will also jump substantially — which is why we have the dues increase. Magazine costs have gone up, NAA fees have increased, we reduced the club charter fee, more is going into Junior Programs and Public Relations, and the cost of living continues to climb. So, although we did well last year and are doing good now, we need to temper optimism with caution.

Note: It has been a matter of precedent that an AMA financial statement be published annually in the general membership publication. Until recently this publication was in the standard accounting type format. The statements were largely ignored or else a matter of complaint — that only legal or accounting types could understand the format. Last year we tried a simplified report, using only words and figures rather than the chart-type presentation. This, too, was apparently not really satisfactory in that it seemed too general, without sufficient detail.

This year still another format is offered — a cross between the description and the chart type. As always, the presentation is intended to show where and how AMA money is received and spent — and to indicate the complexity of national association operations carried on for and by members of the Academy of Model Aeronautics. Further information is available from AMA's eleven district vice presidents — every three months they receive a highly detailed financial statement. In addition, an independent audit of the AMA books is done each year, with copies supplied to the President and the Secretary-Treasurer.

John Worth, Executive Director

AMA Financial Statement Year Ending Dec. 31, 1968

Balance Sheet

Assets:	
Current Assets:	
Cash/Checking Account	\$ 81,946.34
Petty Cash	14.81
Cash/Savings Accounts	28,309.57
Accounts Receivable (owed us):	
Nats Trophy Sponsorship	1,110.00
Misc. Accts. Receivable	917.20
National Assn. of Rocketry	3,123.84
Advances/Employees	84.29
Deferred Exp. (paid in advance):	
Prepaid Insurance & Expenses	12,113.53
Supply Inventory	5,213.05
Fixed Assets:	
Furniture and Equipment	17,402.75
Less: Depreciation Reserve	(6,682.20)
Total Assets	\$143,553.18
Liabilities and Net Worth	
Current Liabilities:	
Accounts Payable (we owe)	2,558.19
Deferred Income (service due):	
Membership Dues/1969	132,904.00
Other	10,803.50
FAI Team Funds (Donations & Program Entry Fees in trust for team travel within U.S.):	
Free Flight	8,119.15
Radio Control	1,588.11
Indoor	646.45
Control Line	—0—
Scale, General	57.00
Other Funds:	
FCC Fund	243.45
Scholarship Fund	1,013.00
Net Worth:	
Deficit: From Dec. 31, 1967	(17,361.89)
Gain — 12 months	2,982.22
Total Liabilities/Net Worth	\$143,553.18

Expense Statement

Operating Expenses — by Department	
Nationals	\$ 35,393.32
Membership	69,623.04
Magazine	55,537.01
Supply and Service	3,136.58
FAI Programs	14,652.39
Contest Administration	8,786.62
Officer Services	2,181.74
General Administration	17,182.54
Total — All Departments	\$206,493.24
Operating Expenses — Detail	
Salaries and fees	79,692.96
Payroll taxes	4,055.47
Rent	4,200.00
Telephone	2,259.44
Postage, general	10,520.07
Office supplies	7,805.68
Public relations	3,676.94
Insurance, general	1,419.58
Legal and audit	1,097.40
Depreciation	1,512.63
Membership supplies	5,077.70
Rulebooks	1,827.50
Insurance, membership	17,980.00
Cost of supplies sold	954.88
Junior programs	2,666.36
Magazine, purchase	32,384.44
Magazine, postage	6,332.77
FAI meetings	991.30
FAI records (NAA fees)	57.51
FAI franchise fee	1,000.00
FAI team expenses, CL	2,642.73
FAI team expenses, Indoor	378.00
FAI miscellaneous	60.84
Nats hobby shop	3,934.13
Nats trophies	3,346.74
Nats officials fees	3,875.00
Nats officials travel	533.52
Nats staff travel	271.85
Nats planning conference	1,019.70
Nats trade shows	439.99
Nats supplies	2,746.17
Nats miscellaneous	1,731.94
Total	\$206,493.24

Income Statement

Operating Income — by Department	
Nationals	\$ 24,699.91
Membership	79,207.42
Magazine	48,509.11
Supply and Service	6,585.33
FAI Programs	14,702.75
Contest Administration	8,979.50
Officer Services	4,054.50
General Administration	20,272.00
Total	\$207,010.52
Operating Income — Detail	
Dues/25,761 members	\$135,150.75
Sanctions (AMA, FAI meets)	2,158.00
Sanctions (FAI records)	350.50
FAI stamp sales	837.25
NAR membership processing	7,500.00
NAR insurance	1,800.00
Supply and Service	5,850.39
Magazine subscriptions	734.94
Mailing services & serv. chgs.	5,732.27
Club charter fees	17,078.95
Non-charter meet fees	618.00
Jr. programs (Aero Club/Wash)	2,334.06
Monthly mailings & Contest cal.	2,101.50
National Capitol meet ('67)	64.00
Nats sponsorship	6,865.00
Nats hobby shop	5,005.06
Nats entry fees	11,447.77
Nats concessions	1,109.08
Nats/other	273.00
Total Operating Income	\$207,010.52
Less: Operating expense	206,493.24
Operating profit	\$ 517.28
Other Income:	
Contributions/life membership	\$ 500.00
Booster fund	641.03
Interest/savings accounts	1,323.91
Net Profit	\$ 2,982.22

Respectfully submitted,

John Worth
John Worth, Executive Director

Record Reviews

A report of selected recent record holders highlighting the designs and equipment used.

FF Unlimited Rubber national AMA record, Open age class: 27 minutes, 40 seconds, established by Walter Ghio, Stockton, Calif., on March 10, 1968.



Ghio's own-design model of 53½" wingspan, 4¾" chord, had its 22" diameter by 22" pitch prop powered by 16 strands of ¼" Pirelli 26" long. Airfoils of the wing and the 20" x 3½" stab both were Ghio's own.

Model was covered with Sig Jap tissue and finished with nitrate dope. Prop parts were from FAI Model Supply; Sig dethermalizer fuse used.

CL ½A Profile Proto Speed national AMA record, Junior age class: 86.09 mph, established by James Wade, Anaheim, Calif., on February 9, 1969.

Model used was the "Santana" design of Dale Kirm, published in the September 1968 *American Aircraft Modeler*. It was powered with a Cox TD .049 fitted with a left-hand crankshaft and fuel tank pressurized from the crankcase.

Prop was a Dale Kirm original single blade, left-hand, of 5" diameter, 4¼" pitch. Victor Stanzel Mono-Line was used for control.

FF Unlimited Rubber national AMA record, Senior age class: 21 minutes, established by William Vanderbeek, Palo Alto, Calif., on September 15, 1968.

This model was designed by Vanderbeek for the Coupe d'Hiver rules, but for the Unlimited record he increased power by using 10 strands of ⅜" Sig rubber 10" long, giving a power run of 20 seconds. (He indicates that six strands would have complied with the Winter Cup rules.) Model has a wingspan of 36", 4¼" chord, polyhedral. Stab span is 14¾", 3½" chord. The planform of both wing and stab is rectangular; undercambered airfoils were used for both. Overall fuselage length is 32½". The prop had 16" diameter and 16" pitch.

The model's wing and fuselage were covered with Jap tissue—the stab with superfine tissue. The model finished with Superior nitrate dope.

Despite a working dethermalizer, actuated by Sig fuse, the record holder reports that the model stayed up for over 15 minutes on each flight—thermals too strong for the model's light weight. Unfortunately the

fuselage was broken during the fourth flight, preventing a fifth flight (and potentially a much higher record) to which he was entitled.

Indoor FAI Stick national AMA records, FAI Ceiling Cat. I and AMA Ceiling Cat. I, Junior age class, established by Kristi Brock, Richardson, Tex., on January 25, 1969.



Kristi's model designed by Ralph Tenny. It has a wingspan of 25.5", major chord of 5.4", 8% airfoil. Stab span is 14", 4½" major chord, 5% arc airfoil. Model weighed .048 oz.

A 17" diameter non-helical pitch prop was used, powered by 2 strands of .073" Pirelli. The model was covered with home-made microfilm. The tail boom of the fuselage was built-up. For bracing, Dacron monofilament was used.

Indoor FAI Stick national AMA record, FAI Ceiling Cat. I, Open age class: 11 minutes, 27 seconds, established by Robert Champine, Hampton, Va., on March 1, 1969.



This original design model of .033 oz. air-frame weight had both the wing and stab mounted off-center to the left. Additionally, the wing and stab chords were tapered, with the left tips ½" wider than the right. Overall wingspan was 25.5", 5½" major chord; stab span 15¼", 3½" major chord. A 5% arc airfoil was used for both wing and stab, covered with Micro Dyne Type A microfilm. The tail boom of the fuselage was built-up ala Bud Tenny.

The prop was of 16½" diameter, 36" pitch, powered by 11 strands of .050" Pirelli 12" long. Green lube was used. The prop thrust line was set at ½" down, 2" left. No steering was required on the record flight.

RC Committee Report

The most significant action of the special committee to investigate the feasibility of an RC organization within the AMA structure was a recommendation to form an RC Executive Council. The committee envisions that the RC Executive Council would be comprised of elected vice presidents from each AMA district, and that each vice president be vested with authority to appoint personnel representing the various RC interests—pylon racing, competitive aerobatic pilots, sport flyers, scale and soaring; the RC Executive Council would have the power and authority to administer all RC matters within the AMA, according to the committee's recommendation.

The committee meeting took place March 1 and 2 during the Toledo RC Conference. The meeting was chaired by Maurice Woods who was appointed earlier as "Presidential Assistant" in the area of RC by John Patton. Members of the committee who were present, in addition to Maurice Woods, were Bud Anders, Tony Bonetti, Ralph Brooke, Curtis Brownlee, Jim Grier, Jim Kirkland and Bill Northrop. AMA President John Patton also was present at the first day's meeting. Committee members not present were Harold deBolt, Phil Heller and Jim Mowrey.

Earlier committee recommendations (which were superseded by the one to form an RC Executive Council) provided specifically that one of the goals of a possible RC organization would be to provide supervision of National Contest RC events so that the interest of all RCers would be adequately represented. Another recommendation, also superseded, was that of separate RC organizations for pattern flyers, pylon flyers, scale flyers, gliders, and Sunday flyers—indicative of the fact that any group or organization representing RC interests will have to cope with a great diversity of interests within RC.

Another committee action resulted in a protest being filed to AMA President Patton with respect to the relative time allocations for the various RC events of the 1969 Nats. Wanted flying hours for pattern relative to pylon racing and scale. Unfortunately, the protest letter was not written until March 26 (the RC meeting ended on March 2, and the AMA Executive Council meeting at which Nats planning was finalized took place on February 28). By the time the protest was received, the entry blanks were being printed, and information had been committed for distribution through model magazines. President Patton indicated that he felt there would be more problems in changing the schedule after the initial publicity than there would be if planning proceeded as approved by the Executive Council. Furthermore, he pointed out a communication from one of the members of the Special RC Committee (who was not present at the meeting), favoring the announced RC schedule, as indicative of the fact that it is not objectional to all the well known pattern flyers.

It is expected that the committee chaired by Maurice Woods will present specifics as to how the committee's proposals, if adopted, would operate to provide different and better results than AMA's present structure, which already has RC people in many positions of authority. (For example, AMA's Contest Board section for RC is already comprised solely of RC modelers.) Not known at press time is whether these proposals and specifics may be presented for possible action at the AMA Executive Council meeting during the Nats.

Maurice Woods (and also his wife and his secretary) is to be commended for the

complete, verbatim, report he presented of the committee's March 1 and 2 meeting—45 pages long. President Patton has authorized distribution of the complete report to AMA officers and chartered clubs. Such distributions will have been completed by the time this issue reaches newsstands. This was being done so that most all could be aware of committee thinking and be able to judge whether or not it represents how most modelers feel—indications sought from both AMA members and clubs.

RCIA Masters Tournament Combines RC Trade Show

The 1969 Masters Tournament will be combined with a Southern RC Trade Show, comes word from the sponsoring Radio Control Industry Association. The joint events will be over the September 13-14 weekend. The Trade Show will take place at the Marriott Motor Hotel in downtown Atlanta, Ga., and the Masters Tournament RC flying competition will take place in nearby Marietta at the Cobb County RC Model Club flying field. The flying will be scheduled to complement the Trade Show hours, allowing contestants ample time to fly and also see the show.

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During the Masters Tournament there will also be a Sport Pylon event and a fun event, probably limbo. These will be for all to enter—not limited by invitation as is Pattern.

The present intention of the RCIA is to continue combining the Masters Tournament with a Trade Show each year, rotating the location around the country.

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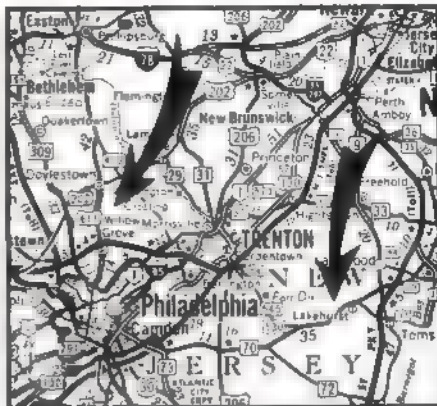




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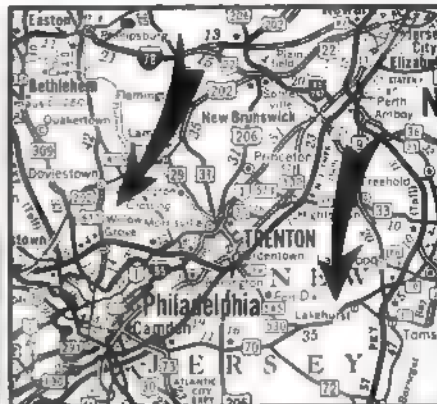
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Bridi of Harbor City, Calif., was guest of honor at a recent banquet meeting. Bridi showed the group a 1½ hour film taken on his six-week good-will RC tour of South Africa. Especially catching the attention of club members were the adverse conditions under which South Africans fly RC models. At place they fly off of a narrow dirt road full of holes and lined with 75 to 100-foot trees. Also, when the South Africans have to send in a radio for repairs, the postage charges alone run \$50! In addition, the good humor of Ft. Worth's Bob Lutker was enjoyed by those who attended the banquet.

British FF Team Member Steps Down

Ray Monks, who had won team spots for both the Wakefield and FAI Power World Championships this year, requested the S.M.A.E. (British equivalent of AMA) to release him from the Wakefield team so that he could concentrate on Power. Bob Wells has replaced Monks on the Wakefield team.

B.I.R.D. Club Follow-Up

Last May 10-11 the AMA chartered BIRD Club of Signal Hill, Calif., put on two 45-minute RC flying shows each day for the California State College. The demonstrations were a part of the Commemorative Air Show at Dominguez Hills, Calif., site of the First International Air Meet in the U.S. (in 1910). On July 4th the BIRD Club is planning a repeat performance at the Corona Air Fair. Last year the Corona RC show was broadcast live over local radio stations. In April the club participated in a PTA Carnival in Garden Grove; the field was too small for safe flying, so RC models were limited to taxiing demonstrations and static displays. A busy group!

NMPRA Champ Season Explained

The National Miniature Pylon Racing Association, AMA affiliated, allows RC Pylon flyers to accumulate points for the NMPRA Season Championship only from April 1 through October 31. NMPRA Editor Ed Shippe explains that this is so flyers in warm weather climes — California, Texas, Florida, etc. — won't have an undue advantage over their northern neighbors. "You can accumulate points all year long toward an Exhibition Pilots classification," says Shippe, "so be sure to turn in your points all year long if you haven't made the rating."

RC Check Out Tip

The newsletter of the AMA chartered DC Radio Control Club provides a simple, but important, spring tip.

One of our very experienced flyers and builders arrived at the field the other day with a newly-hatched Senior Falcon. He checked everything out, made some adjustments, and then taxied her out to takeoff. The model promptly went into a left-hand bank, and hit with a horrible clunk. We are pleased to remark that the plane was not seriously damaged. Postmortem showed that the confident flyer had his ailerons hooked up backward. Lesson: check, and check again.

RC Boats/Cars Illegal on 72 mc

Club officers have indicated concern to AMA HQ that some modelers, including AMA members, are violating the law by operating RC model boats and cars on 72 mc. Such operation, in addition to violating federal law, voids the AMA insurance coverage which applies to boats and cars as well as planes. Only legal RC operation provides insurance coverage.

AMA was not responsible for boat or car

modelers not being able to enjoy these frequencies. It is simply that RC airplanes have a special safety problem to which the FCC, in its frequency allocations, was receptive—that there was more likelihood of interference to airplanes (because they are up high) than to ground level activity; and, therefore, special consideration was justified.

RC Free-Style Pattern

From R C Spirit, newsletter of the AMA chartered Spirits of St. Louis Flying Club, we learn that the club was planning to introduce a free-style RC pattern event option for the expert class in their June 21-22 open contest. Each contestant would make up a flight plan from among the maneuvers in the AMA rule book; then he would be judged on (1) maneuver selection, (2) flying ability and (3) overall presentation. "It is hoped that this format will bring to the contest a 'free style' type of flying demonstration to relieve the repetition of identical pattern flights," said Contest Director Bill Butters.

Fitting Fairings to Struts

A simple way of fitting hardwood fairings to wire struts is to take a piece of the same diameter as the strut, and sharpen one end by either filing or grinding it flush with the face of the wire. Then, using this as a spoke shave, gouge out the material until the desired depth is reached. By using a wire the same size as the strut, a good tight fit will be had. This tidbit was in Servo Chatter, publication of the AMA chartered Aero Telemechanics MAC, Oak Park, Ill.

CL Rule Clarifications

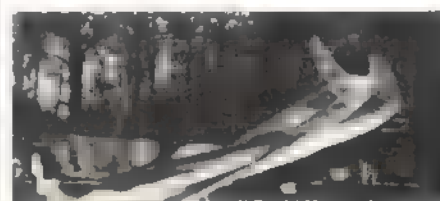
Control Line Construction. CL Contest Board Chairman Laird Jackson has issued an interim safety rule that the prohibition of braided (or stranded) lines is applicable for 1969 only to Gas and Jet Models, Control Line Speed, and that the 1968 rule which allowed braided (or stranded) lines will continue to be applied this year to other control line category models.

When the sentence, "Lines of braided or stranded construction will not be allowed," was added to the 1969 Control Line Speed rules, a problem was caused in other control line categories which refer to the Speed rules for line construction information. The Contest Board expects to review the line requirements for all events in order to produce clearer definitions for the 1970 rule book.

Profile Models. The following definition has been issued by Howard Mottin in finishing business instituted by him last year as 1968 CL Contest Board Chairman—a clarification of the term, profile, as used in Scale Racing (Goodyear) and Profile Carrier regulations.

"The fuselage of a profile model resembles that of a conventional airplane in the side (profile) view only, and appears as a thin flat sheet in the plan (top) view. The engine shall be completely exposed from the mounting lugs to the cylinder head, and shall not have any type of fairing. Additional reinforcement at the fuselage nose section is permitted. In the case of an inverted or upright engine installation, the motor mounts may protrude from the fuselage sides."

The Contest Director is the final authority at a contest on models meeting the intent of this rule. The CD is urged to use discretion and common sense in applying the rule and in determining whether a contestant is in violation of the intent.



At this time of year it is pleasant to report on a cold, winter contest, as these photos depict. The uppermost shot shows balloon bust entries lined up in the snow awaiting official flights. Judges and contestants are in the background — note plastic-covered frame for wind protection. Center photo shows a near miss in the balloon bust contest, an excellent action shot by Dan Driscoll, who took these pictures. The lower photo shows Rich Wasnicki pull-testing his Nobler, flanked by Ruben MacBride on his right and Al Thornton on his left. The contest was the AMA sanctioned Snowbird Challenge Meet at Lincoln Park, N. J., February 16, sponsored by the Garden State Circle Burners. Contest Director Art Cangialosi reports that the temperature was 20 to 25 degrees, winds were light, the sky was clear, and the ground had a snow cover of 1 to 10 inches — "ideal contest conditions!"

AMA News Extra

CONTEST BOARD MEETINGS--1969 NATIONALS

Meetings of the three AMA Contest Boards, involving 33 modelers throughout the country who represent modelers in each of the 11 AMA regional districts, will be held during the 1969 National Contest (N.A.S. Willow Grove, Pa., July 14-20). Purpose of the meetings is to discuss and either accept or reject rule-change proposals which have been submitted by AMA members during the past year. Each of the 11-member Contest Boards is comprised of experts in their respective category. The Radio Control Contest Board consists solely of RC modelers--likewise the Control Line and Free Flight Contest Boards consist only of CL and FF modelers, respectively. Board members are appointed by AMA District Vice Presidents who are put in office for two-year terms in a general election by AMA members.

Through means of the Competition Newsletter provided to about 450 AMA chartered clubs and over 2,500 subscribers, most competitors as well as many other AMA members will have already seen the detailed Contest Board agendas and, hopefully, will have been in touch with their district Contest Board members to express their favor or opposition to the various proposals. Recognizing that it is not possible to print here the detailed proposals which will be dealt with, it is suggested that interested modelers (who have not reviewed the proposals) contact an officer of the nearest AMA chartered club for details (see listing beginning p. 80 of 1969 AMA rule book). Following is a summary of the items before the Contest Boards.

RADIO CONTROL

Pylon Racing. To consider whether Formula II should be retained or whether it should be replaced by Sport (Open) Pylon, a new Bendix/Thompson class, or a new class for scale model Unlimited Racers. The Board also intends to review present Sport (Open) Pylon rules especially relating to wing area and minimum wing thickness.

Pattern. To consider whether there may be present "grab bag" maneuvers which are unpopular (or unjudgeable) and should be removed. Also, to consider a championship-caliber class.

Scale. To consider a class de-emphasizing scale fidelity judging by doing such judging at a distance from the model--on the order of 6' to 10'. Also, to consider adopting FAI rules but with AMA aircraft limits, to consider tightening the builder-of-model rule, to consider further defining the allowed degree of prefabrication.

CONTROL LINE

Speed. To consider requiring two-line control systems in most categories. To consider several Junior-only or Novice event revisions and additions: Class C with .40 limit; a Sport Speed event with .36 engine limit and point adjustment according to engine size; a Class B Profile Proto event; a Beginner's Class B Speed event with engine restrictions; a Beginner's Class B Proto Speed event. Also, to split present Class C into two classes having limits of .301-.400 and .401-.650, to not disqualify previous Flights for a whipping infraction, to restrict engines to those available through the U.S. hobby dealer-distributor network, and to allow Proto Speed flyers two full laps for getting in the pylon.

Scale and Dive Bombing & Strafing. To consider revising the minimum required wire diameters of the control line(s).

Scale Racing (Goodyear). To consider limiting the fuel capacity to one ounce, lengthening the heat and feature races, and revising the name of the category.

Stunt. To consider classifying entrants as Novice or Expert instead of by age, to allow a second model in some instances, and to provide a graduated break-down of minimum wire sizes for engines from .401-.650.

FREE FLIGHT

General. To consider reducing the max flight limits for all categories together with reducing the gas-powered model engine run, to specify the required time period for completing outdoor record flights, to allow entry of two models in events presently limited to one, to allow others to start and regulate the engines of Juniors larger than .051, to restrict entry in an event (or class) to once, to create a new Provisional class for Catapult Gliders with participation limited to Juniors. Also, to review whether the present Provisional and Supplemental categories (Helicopter, Payload & Cargo, Easy Indoor and Coupe D'Hiver) should remain in their present status, be elevated to "official" rules, or be dropped from the rule book.

Gas. To consider the adoption of categories for various size flying fields by keying engine run, max flight and flyoff into four groups, and in conjunction, to provide for hand-launch only of landplane models.

Indoor. To consider revising the requirements for cabin models and the measurement of required minimum fuselage cross-section. Also, to consider revising the rule book paragraphs for Official Flight, Unofficial Flight, Timing and Scoring.

By special arrangement with the publisher this page is produced at the very last minute, just before the magazine is printed, to bring you the latest news concerning current Academy of Model Aeronautics events of national significance.

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Which officers live in your district? Select correct address when writing officers.

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- XI: R. Brooke, 17845 3rd Ave., S.W., Seattle, Wash.



CONTEST CALENDAR

Official Sanctioned Contests of the Academy of Model Aeronautics

July 4 — Vineland, N.J. (AA) VMAC 4th July CL Meet. Site: Landis Park. P. Hales CD, St. Bernard St., Metairie, N.J. 08038. Sponsor: Vineland MAC.

July 4 — Mentor, Ohio (AA) M.A.R.C.S. All RC Pylon Day. Site: Field. F. Vidmar CD, 26906 Zeman Ave., Euclid, Ohio 44132.

July 4-5 — Tullahoma, Tenn. (A) U-Control Meet. Club Flying Field. C. Anderson CD, Rt. 2, Tullahoma, Tenn. 37388. Sponsor: Coffee Airliners.

July 4-6 — Tulsa, Okla. (AAA) Tulsa Glue Annual FF, CL RC & Indoor Meet. Site: TGD Field. W. Sainikov CD, 9906 N. Yale, Tulsa, Okla. 74135. Sponsor: Tulsa Glue Dobbies.

July 5-6 — Frederick, Md. DCRS Birth of July RC Meet. Site: Municipal Airport. M. Hill CD, 2001 Norvale Rd., Silver Spring, Md. 20910. Sponsor: DC RC Club.

July 5-6 — San Jose, Calif. (AA) Wavemasters RC Contest. Site: Club Flying Site. R. Morse 3351 Pruneridge, Santa Clara, Calif. 95051. Sponsor: San Jose Wavemasters RC Club.

July 5-6 — Sebring, Fla. (AAA) Confederate Nats for FF, CL, J. Wagner CD, 274 E. 9th St., Hialeah, Fla. 33156.

July 6 — Queens, N.Y. (AA) Luftmeister Custom Tailored Stunt & Flying Scale Meet. Site: Flushing Meadow Park. M. Bianchini CD, c/o 131-30 223 St., Laurelton, N.Y. 11413.

July 6 — Denver, Colo. FAI FF Qualifying Trials. Site: E. Collins Air Park. M. Collins CD, 4318 E. Utah Pl., Denver, Colo. 80222. Sponsor: Magnificent Mountain Men.

July 6 — Urbana, Ill. (AA) C-U Aeronauts 7th Annual CL Meet. Site: Union Airport. J. Fasmpour CD, 310 E. Benham St., Toluono, Ill. 62582. Sponsor: Campaign-Urbana Aeronauts.

July 6 — Suffield, Conn. (AA) Nor-East Air Races RC. Site: NCRCC Model Air Park. G. Sawn CD, 6 Audre Lane, Thompsonville, Conn. 06082. Sponsor: Northern Connecticut RC.

July 12-13 — Somerville, S.C. SC Lowland Fun Fly. Site: CRCS Flying Field. J. Bradham CD, Hawthorne St., Sumter, S.C. 29105. Sponsor: Charleston RC Society.

July 12-13 — Albuquerque, N.M. SWAT FF Qualifying Trials. Site: Boy's Academy. C. Averill CD, 2314 Palomas N.E., Albuquerque, N.M. 87110. Sponsor: South West Aero Team.

July 12-13 — Oaks Corners, N.Y. Hobo Fun Fly for RC. Site: Haves Rd. H. Ford CD, 11 Stephens St., Clifton Springs, N.Y. 14432. Sponsor: Sky Rovers RC Club.

July 12-13 — Oldcastle, Ontario, Canada RC Meet. Contact: Len LaPorte, 3236 Bernard Rd., Windsor, Ontario.

July 12-13 — Oklahoma City, Okla. (AAA) Sooner State Aviation Championships for FF & CL. Site: North Western 33 Memorial. F. Miller CD, Rolling Ridge, Bethany, Okla. 73008.

July 13 — Hastings, Minn. Mpls. FAI FF Qualifications. Site: Webers Flying Field. D. Monson CD, 131 W. Wentworth Ave., W. St. Paul, Minn. 55118. Sponsor: Minneapolis Model Aero Club.

July 13 — Hastings, Minn. (AA) Minneapolis MAC Annual Summer FF Meet. Site: Webers Flying Field. D. Monson CD, 131 W. Wentworth Ave., W. St. Paul, Minn. 55118. Sponsor: Minneapolis Model Aero Club.

July 13 — Fountain Valley, Calif. (A) Rubber & Glider Meet for FF. Site: Mile Square. G. Wallock CD, 229 LeRo Ave., Arcadia, Calif. 91006. Sponsor: Thermal Thumbers.

July 13 — Richmond, Va. Brainbusters FAI FF Qualification Trials. Site: Curles Neck Farm. D. Orr

CD 102 Bickfield Dr., Hampton, Va. 23360. Sponsor: Brainbusters.

July 13 — Weston, W. Va. Central West Va. Model Club RC Meet. Site: Jacksons Mill Airport. G. Villard CD, 3301 23 N.W., Canton, Ohio 44708. Sponsor: Central W. Va. Model Club.

July 14-20 — Willow Grove, Pa. (AAAA) 1969 National Model Airplane Championships. Site: Naval Air Station. See June issue AAM for event details.

July 19-20 — Tacoma, Wash. (AA) Mount Rainier RC Society W. W. I Contest for Scale Replicas. Site: Bethel School Dist. Location. M. Gale CD, 811 9th Ave. S.W., Puyallup, Wash. 98371. Sponsor: Mt. Rainier RC Society.

July 20 — Denver, Colo. (A) MMM Monthly Outdoor Meet. Site: Prop Busters Field. D. McGhee CD, 1260 Elm, Denver, Colo. 80220. Sponsor: Magnificent Mountain Men.

July 26-27 — Tahlequah, Okla. (AA) 2nd Annual Tahlequah Cup RC Races. Site: Municipal Airport. A. Wingo CD, 2615 Elgin, Muskogee, Okla. 74401.

July 26-27 — Sunnyvale, Calif. Kosby Memorial Contest. Site: Pioneer Field. J. Sunday CD, 6887 Rainbow Dr., San Jose, Calif. 95129. Sponsor: Pioneer RC Club.

July 27-Aug. 2 — Rockford, Ill. EAA Delta Dart Program. Site: Greater Rockford Airport. J. Orega CD, 255 Grand Blvd., Bedford, Ohio 44014.

July 27 — Portville, N.Y. Fly for Fun RC Meet. Site: 1 Mi. So. on Rt. 440 adjacent to Gravel Pit. G. Flynn CD, Rt. 2, Box 455, Olean, N.Y. 14700. Sponsor: Olean MAC.

July 27 — Dayton, Ohio Midwestern CL Championships. FAI CL Team Selection Meet. Site: Municipal 333 Flying Field. C. China CD, 5028 Broughton Pl., Dayton, Ohio 45431. Sponsor: Dayton Buzzin' Buzzards.

July 27 — Chicago, Ill. (AA) 4th Annual Aero Angels Model CL Meet. Site: Irving & Cumberland. A. Rardt CD, 7371 N. Lincoln Ave., Lincolnwood, Ill. 60467. Sponsor: Chicago Aero Angels, Inc.

July 27 — Irving, Tex. FAI FF Trials Site: New S.W. Airport. B. Wilder CD, 2010 Boston, Irving, Tex. 75060. Sponsor: Dallas Cloud Chasers.

July 27 — Fresno, Calif. (A) Fresno Monthly FF Meet. Site: Near Kerman. F. Gallo CD, 1725 Kenmore Dr., W. Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.

Aug. 2 — Salt Lake City, Utah (AA) Summer RC Fiesta. Site: Saltair Modelport. C. Panzier CD, 1781 Mountain View Dr., Salt Lake City, Utah 84108.

Aug. 2-3 — Chicago, Ill. (AA) 3rd Annual SAC RC Contest. Site: Flossmoor Rd. & Central Ave. S. Peterson CD, 6416 LaPorte, Chicago, Ill. 60638. Sponsor: Suburban Aero Club of Chicago.

Aug. 2-3 — Cleveland, Ohio (AAA) Cleveland Jr. CL Air Races and FAI CL Team Selection Meet. Site: Cleveland Flying Field. A. Montagnino CD, Daisy Ave., Cleveland, Ohio 44109.

Aug. 2-3 — Riverview, Mich. (AA) 16th Annual

Continued on page 72

Many of the photographs in the AMA News section were contributed by AMA members. If your favorite type of model is not pictured, most likely none was received. Your assistance is requested in submitting interesting photos on all subjects, together with sufficient information for captions and photographer's name. Send photos (which cannot be returned) to Picture Editor, AMA HQ, 1239 Vermont Ave., N.W., Washington, D.C. 20005.

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R/C World

Continued from page 35

Nearby flying and boating demos should perhaps be held down to a couple of hours. As was the case in the Asbury Park affair, continuous flying (Saturday only) and R/C boat operation within sight and sound of the exhibition hall doubtless kept away from going in—and drew many others away from the exhibition area for long periods (it was nice out in that warm sun!).

One might think that 1000 paid customers coming to see the wares of manufacturers and dealers would be considered a bang-up affair. In smaller, less costly quarters it would be, though there probably then wouldn't be room for that many exhibitors! In a very large hall, as we had at Asbury, and spread over two whole days, these numbers could spell a loss for the sponsoring group. Probably exhibitors felt the same way.

The Monmouth boys had scheduled an informal banquet for 9:15 Saturday evening. Unfortunately, a previous banquet in the same quarters ran far overtime, and the R/C group didn't get in to eat till more than an hour later. The hotel simply reneged on a promise.

But the 4th Annual Monmouth MAC R/C Show was not a disaster! It did bring out the point that we will have to be more careful of the timing and location of such affairs in the future.

Competition

Plea for 1/4-midgets: Noting there is little activity in what they feel could be a very interesting category, Bob Penko (9183 Rt. 306, Kirtland, Ohio 44094) says his club (the Mentor Area R/C Society) will sponsor a 300 sq. in. race on Oct. 5th at their club field. They have never heard of another

race for planes of this size, so are inviting everyone in the U.S. Trophies will read World Champion. Rules are very simple. Besides 300-sq. in. wing area, planes be powered with stock 15 engines fitted with throttles so they can land with power on. Wings must have 7/8" minimum thickness at the root. Fuselage must total 5" high at canopy or windshield, must be at least 3" wide cockpit, which must hold a "pilot." Planes must be semi-scale copies of any plane that has ever raced. Course will probably be similar to that used for Formula 1 but with pylons 300' apart, with 10 laps equal to 1 mile. Race-horse starts, no handicaps.

Bob says they have several planes of this description flying, both scale and non-scale, and problems have shown up. They have had a ball with simulated races. Most builders have omitted rudder, or coupled it with ailerons. CAR is no problem, as one-piece planes (non-removable wing) in this size are entirely practical.

Datatron, Inc., Santa Ana, Calif., announced May 1, it had reached an agreement in principle to acquire Orbit Electronics, Inc., and its wholly-owned subsidiary Micro-Avionics, Inc. Both will operate independently as wholly-owned subsidiaries.

Orbit Electronics and Micro-Avionics are two of the leading manufacturers specializing in electro-mechanical guidance devices used to remotely control model airplanes, boats and race cars. Recent applications include remote control of bulldozers operating in hazardous terrain, and control of movie mounted on race cars in filming the movies "Grand Prix" and "The Winners." Combined sales in fiscal 1968 were in excess of one million dollars.

Datatron will retain the present management of William M. Semple, President, and Robert J. Dunham, Vice President.

IT'S NEW!

FROM STERLING



Kit FS-24 Wing span: 55" Length: 43" For engines: .45 and up

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Pride of the Luftwaffe in World War II! Now Sterling recreates the ME 109 in profile R/C that's almost ready to fly. Get the ME 109 this Friday, fly it on Sunday!

Kit features brilliantly high gloss red plastic covered foam wing panels, ready to join; assembled ready-to-go factory-built fuselage in which the maple motor mounts, maple nut blocks, birch plywood sides, birch wing saddle, etc., have been factory installed. Two sheets of giant authentic decals; plastic canopy, wing tips and hatch; formed wire gear, a Sullivan fuel tank, all required hardware, nylon horns, nylon push rods, etc.

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Kit D-5 Length: 23 1/4" Beam: 2 3/4"

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New in R/C

By Howard McEntee

Ready-made balsa plane kit line by Midwest Model Manufacturers (Salt Lake City) expanded again. Now available Lazy J MK II, we learn from Eastern Distributor, M & D Products (Box 404, Paramus, N.J. 07652). Improved "J" has 50" span, 450 sq. in. For 29-45 engines, kit costs \$39.95. All planes in line come completely finished, sanded, ready to cover; all surfaces balsa-sheathed, control surfaces hinged. Included: cockpit canopies, nylon pushrods, keepers. Biplane is "Little Dove," with tail-dragger LG, wheel pants, 780 sq. in. wing; \$44.95. Mini-Monk similar to Lazy J; instead of trike LG, two wheels with pants; engine inverted; \$49.95. Soon available, 21" scale Schweizer sailplane; 80" span, all-balsa fuselage planked to proper contours. Wing in halves, not sheet covered; plane comes sanded, ready to cover. Finish; \$79.95.

Difficult to locate small diameter back-up wire, needed for sub-min installations. Package of 3' lengths in six different colors, now part of More-Craft "Goodies" line, from Ace Radio Control (283 W. 8th St., Higginsville, Mo. 64637). Wire is a bit under 1/8" dia. including PVC covering, very flexible, \$1 per package. Ace stocking up on many sub-min parts, since they push tiny planes featured at Toledo display. Fokker D8 and Nieuport 17 profiles are first planes for which Ace sells plans (\$1 each). Next will be Trainer similar to Cub or Cessna, then an ancient Blériot; latter 30" span, 162 sq. in. area, rear portion of fuselage open construction (though a profile). Soon others to follow.

Fine kit by Johannes Graupner concern (Germany) for the Kwik-Fly III (that's how they spell it) available at B. Paul (413 E. Allegheny Ave., Phila., Pa. 19134). Kit has several unusual features. Front fuselage-side sheeting sandwich of two layers of balsa, one of thin ply; these assemblies come cemented, shaped and curved. Many fuselage formers 1/8" thick 3-ply balsa. Die-cutting extremely good. Kit includes two kinds of cement (white glue, cellulose glue), three 2 1/2" aluminum and sponge-rubber wheels, finished dual-strut nose gear. Two large plan sheets for construction, two for installations of two types of digital multi-control systems marketed by Graupner, but most helpful). Four instruction books in four languages, very detailed lists of parts, many assembly photos, clear instructions. \$43.95 from above address, plus 5% handling and shipping.

"Semiconductors, From A to Z," No. 493 from TAB Books (Blue Ridge Summit, Pa. 17214), covers semiconductor field thoroughly, in language that the average electronic tinkerer can understand. Field is covered completely, including new and exotic units not yet in wide use. Has 292 pages, over 11-

illustrations, 26 chapters. Intended to show how these operate, not as give operational circuits might be utilized in R/C. Partial circuits to illustrate principles. Paper cover \$4.95.

Little room in Toledo coverage (June issue) in detail new line of plastic planes from Carl Goldberg Models, Inc. (Chicago) First design is Ranger 42, very attractive cabin high-wing mono that can be flown P/P — up to fullhouse multi! Latter demo-flown at Toledo. 42" span; trike LG; upright engine from 049-09, depending upon radio equipment carried. Costs \$14.95. Foam wings nothing new, but foam fuselages not common. Special foam densities for each to give desired strength. Retain light weight.

Fuselage foam is difficult to crush between finger tips. Fuselage comes with ply floor, side rails, nose main landing gear block installed. Wing, molded in one piece, special airfoil for top efficiency and lift. All required nylon fittings, nuts, bolts, other hardware. Estimated average per (not experienced modeler) have plane ready to fly in 6-8 hours. Designed to appeal to the non-modeler as novice, with hopes of luring this group into further R/C flying.

Main of new digital system may be familiar to readers; however, little tachometer as well-known. Jokingly called "Thumb Tach," this kit is OD-69 expressly for plane engines. Indicates rpm of many other items. An optical instrument — simply unit and get direct, immediate reading. No load placed on engine. Photocell under a lens picks up light pulses from pulser; pulses electronically meter has two rpm ranges (0-5,000 and 0-25,000) cover idling to top speeds. Calibration instantly checked by unit at 60-cycle lamp; scale to be accurate to 2 1/2%. Since props have two blades, instrument gives actual when pointed at such a prop. Conversion factor allows with other numbers of blades. Powered by internal 9V battery; regulating circuit assures accurate reading as battery voltage drops. Maker claims 2-1 hour assembly time. Kit \$19.95 from Heath Company (Benton Harbor, Mich. 49922).

With increased interest in smaller planes with simple rudder proportional control, Controlaire (World Engine Inc., 9900 Kossuth, Cincinnati, Ohio 45236) single-channel pulse system be of real use. Pulsed-Mule transmitter (regular Mk II Mule with built-in pulser). Compact transmitter tuning adjustments, comes with center-loaded antenna. Pulse-width lever projects from top case, also a trim lever. Only other control is on-off switch (fitted with off-lock). Superhet receiver similar to Controlaire SH-112 with no relay, but mounted on open (no P.C. 3 1/2" x 1 1/4"). has mounting grommets four corners, and on one end

Special Notice to Owners of COMMAND MASTER RADIO EQUIPMENT

Over two years ago, Sterling Models sold its interest in Command Master to Balsa Corp., which firm has since gone out of business.

Although Mr. Milton Miller, of Balsa Corp., has undertaken to see through service and repair, there are extended delays in this service. Therefore, Mr. Ed Manulkin, of Sterling, has made an arrangement with the original designer of Command Master, to provide prompt service and repair.

Those having need of this service should send their equipment to:

**Mr. Dick Jansson
R/C Corp.**

6 Pine St., Wellesley Hills, Mass. 02181
This information is presented on the request of Sterling Models.

is mounted large-size Adams actuator. With outfit comes a dual nickel-cad pack of 500 mAh cells, wired switch and connector. Wiring is complete — no soldering to. Completing outfit is single charger for receiver battery; has isolation transformer (many multi-digital transmitters don't have this safety feature!) pilot lamp. Costs \$78.98 ready to use. Needs only 9V battery for transmitter (Eveready 270 equiv.). Plane installation weighs 4 1/2 oz.; could save about 1/2 oz. weight by substituting Adams Baby actuator — price same. New item from W.E. is the Servo Tester, kit form at \$9.98. Intended especially for checking Controlaire and MAN 234 digital servos, can be adapted for many other types. Consists of metal with pot on top. Inside is integrated circuit and several small parts. to mounted on the furnished P.C. board. Unit has connectors to receiver battery pack and to servo.

Twin-cylinder R/C engine is Kronk Twin RC61. Import from Germany (Kronk Mfg. Co., West Julian St., San Jose, Calif. 95110). Engines hand-made, \$90, come complete with throttled carburetor, twin mufflers, precision ball bearings. Weight 20 oz. Using 11-8 or 12-5 prop rpm range is 2,000 to 14,000, according to manufacturer.

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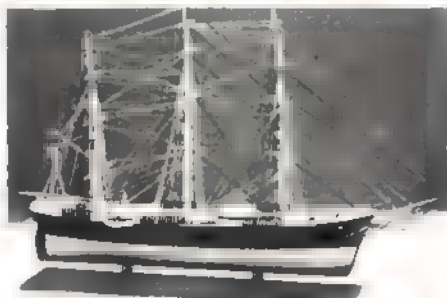
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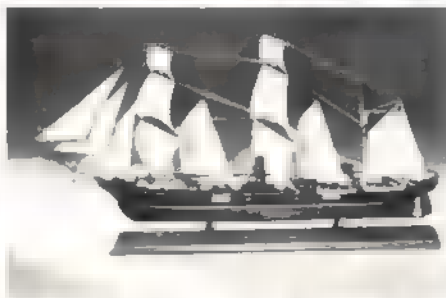
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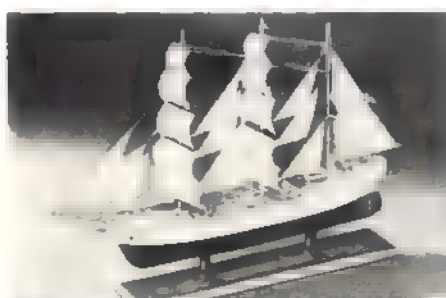
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Kit 167 FLYING CLOUD, CLIPPER SHIP, 13 3/4" model. collector's item you'll be proud to display \$8.95

Martin MO-1

Continued from page 29

section at the tip. Don't cut out the ailerons until the wing has been completely shaped and sanded. Notice I said "ailerons" and not "flaps." The MO-1 had no flaps, so the ailerons are used as ailerons during low speed to bank the model toward the outside of the circle and hold the lines tight.

At this point it would be good to make all the assorted hardware, such as the aileron horns (which I found to be easy to make from mild steel welding rod material), the aileron transfer horn, the arresting hook and tail skid on their plywood mount; the main landing gear on its plywood mount, the fuel tank, firewall, bellcrank mount, leadout guide, and motor mounts.

Some of the special construction techniques developed by Don for this model are apparent. His first MO-1 had a solid balsa wing which failed in flight, so the redwood leading edge was incorporated to strengthen the wing. Special motor mounts were needed to tie the nose to the wing to eliminate a stress crack in the fuselage at the wing leading edge, so mounts were laminated from birch plywood to tie together the wing, bellcrank mount, firewall, landing gear mount, and the fuselage bottom. Also the top block on the motor was changed from balsa to bass and extended back over the leading edge of the wing. Oh yes, the motor had to be moved as far forward as the nose would allow to keep the center of gravity in a decent location, and it has been mounted in a side-winder fashion like on a combat plane, no outboard tip weight is required.

One word about the control unit, and then we'll continue with the construction. The bellcrank is the J. Roberts inverted unit with the bellcrank cut to 29°. These can be purchased from Sturdi-Built, or you can get the custom assembled unit from Bill Johnson, the "Throttle Specialist." Bill's units are made from Sturdi-Built parts, but because he only does custom work, he can get a better fit and smoother operation. All

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his units are assembled with countersunk rivets, which adds to their safety factor. I also recommend the use of his fuel metering system which allows the hottest of racing engines to be run on pressure and yet to be throttled like the best R-C engine. The single throw set-up for the exhaust slide and fuel meter is also available from him by ordering the Don Gerber MO-1 single throw modification.

Now that most of the small details have been discussed, let's start assembling these little parts together to make an operating model. Cut out the ailerons, shape their leading edge, glue the horns to them, and hinge them to the wing with the horns running through the slots in the bottom of the wing. Glue the cap strip over the slots and the leadout guide to the inboard tip, and the wing is finished.

To start the fuselage construction, drill the motor mounts for the mounting bolts and bolt the motor to them using blind mounting nuts. Then glue in the firewall and main landing gear. Next, mark the centerline on the bottom of the wing and glue the wing to the motor mount unit, making sure to align the motor mount and wing centerline perfectly. Attach the leadouts to the bellerank, bolt the unit to the plywood bellerank mount, and glue the whole unit to the bottom of the wing with the bellerank hanging down. This will go right around the motor mount.

Cut out two identical fuselage sides and glue the tank to the inboard side. That's right—glue it on! Add filler blocks between the motor mounts and the fuselage side, and glue the inboard fuselage side to the motor mount-wing-landing-gear unit. Make the elevator pushrod long enough to reach to the vicinity of the elevator horn and attach it to the bellerank. Also, make up the throttle pushrod and run it to the engine. This has been omitted in the plans because of the many types of throttles that can be used. Install this in suit the type of throttle that you are using in your engine. After this has been installed, the engine should be removed. Filler blocks added to the outboard side of the motor mounts, and the outboard side of the fuselage glued on.

Shape the rudder, stabilizer and elevators, hinge the elevators, and glue these together as a unit. Now position the stabilizer in the rear of the fuselage, adjust the pushrod to the correct length, and glue the unit to the fuselage, pulling the rear end of the fuselage together at the same time.

The arresting hook and tail skid unit will be installed along with the rest of the aileron linkage. The spring should be just strong enough to pull the hook down and deflect the ailerons, but not strong enough to flip the plane up on its nose. With the addition of the fuselage planking on the top and bottom, this thing finally looks like a plane. But wait, it doesn't have any motor now! You took it out. Remember? Build a removable cowl section into the outboard side of the nose. This should be just large enough to get the motor in and out, and to get to all the plumbing and throttle linkage required for your engine.

The finish consists of two coats of clear dope lightly sanded, one coat Hobbypoxy Stuff wet sanded, and one coat of Hobbypoxy color sprayed on. The color scheme is gray fuselage and wing and stab bottoms, with yellow wing and stab tops. With red, white, and blue stripes on the rudder, and the white star with red center on a blue circle on the top and bottom of each wing, it makes a colorful little plane. The total weight should be 24-28 ounces. With this lightweight and small size, the MO-1 is a real competitor, so why don't you build one and compete?

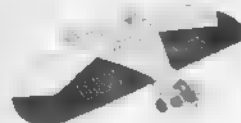
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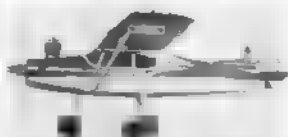
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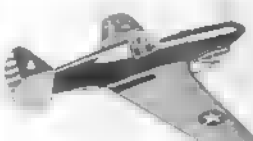
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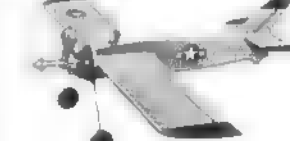
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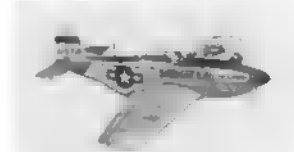
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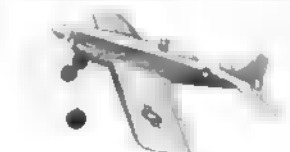
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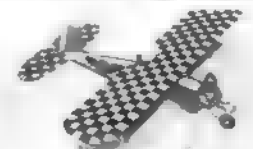
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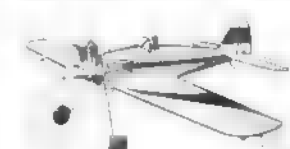
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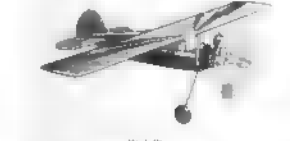
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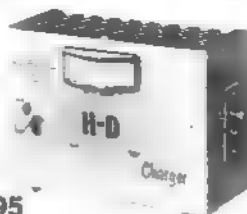


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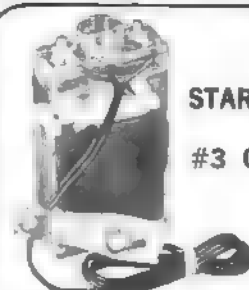


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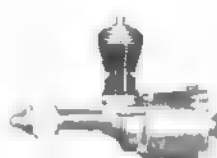
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Continued from page 23

mold dry for 24 hours and then peel the rubber mold off the cowl molding. You'll find that it is about 1/16" thick and fairly stretchy; however, it retains its shape. Wash out the inside of the mold with warm water and behold, one master female rubber mold. You can make all the replacement cowlings you want.

To make a fiberglass cowling, we need a supporting frame. Get an 8"-square piece of 1/2" plywood or hardboard. Lay it over the firewall of the plane and trace around the firewall with a pencil. Carefully cut out the hole in the plywood and save the center piece. Now build a little box (no top or bottom) about 6" deep. Nail the plywood to the box. Push the rubber mold through the hole until the lip of the mold supports the mold all around the hole and the mold is hanging down inside the box. Put a bead of glue all around the lip of the mold and glue it to the top. Place the center piece into the top of the mold to ensure the mold has exactly the shape as the front of the airplane firewall. Let the glue dry and remove the center form.

A fiberglass cowling can now be formed. Mix up some polyester resin and lay in a coat of resin all over the inside of the mold. A parting agent isn't really necessary. Let the first coat almost dry. While the first coat is setting up, cut out 2" wide by 6" triangular pieces of 4 oz. glass cloth, about enough to go all around the mold four times. Lay a triangle of cloth in the mold when the gel coat is still tacky and apply resin through the glass cloth. Repeat until you've built up about four layers all around the mold and let dry. The cowl molding will be about 1/16" thick. The cowl molding should be dry in about two to four hours. Break the lip of the mold loose from the box (the rubber

stretches) and push the mold out the bottom of the box. Peel the rubber mold off the cowl molding and trim the cloth.

The rubber mold can be used over and over. Cut out the holes in the cowl molding with a sander on your Moto tool and trim to fit around the engine and against the firewall. Install hardwood mounting blocks on the firewall, place mold over blocks, and drill with 1/8" drill. Tap the wood blocks with a 4-40 thread; the cowl molding can then be mounted with 4-40 screws.

Cover the airplane with silk and finish any way you wish. Super MonoKote could also be used. It would be a crime to put a good finish on the plane after this much work. The cockpit can be spruced up with a man and Tatone instruments. I mounted my instruments on a 1/8" burnished aluminum panel. I also used one of the Williams Sportsman 2" pilots which helps give the impression of a true home-built aircraft. The inside of the cockpit is painted flat black. Don't forget to install a cardboard shield around the wing hold-down hole so that the screw can't get loose and rattle around in the cockpit. Epoxy the canopy to the plane after it is all painted, then mask the border of the canopy and paint with matching color.

I'm sure you'll like the way the wide-tread landing gear helps the airplane stick to landings. The 3/16" wire may be a little hard to come by unless you check the Yellow Pages for a local spring manufacturer. You can obtain 6 ft. of the stuff from him for about 50¢.

If you complain about having enough room in the fuselage to get your big fists in, you're nearsighted and using radio gear. Proportional gear is recommended but it could be flown with reeds. Just lengthen the elevator horn. I'm sure you'll get as much pleasure out of building and flying the Jungster as I have.

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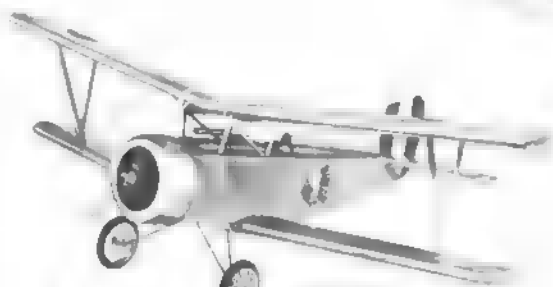
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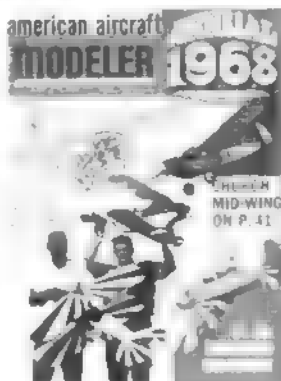
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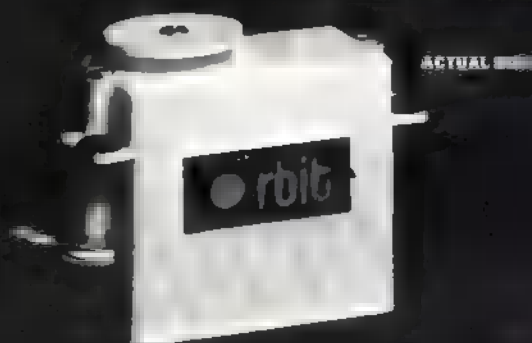
be operated by nearly any of the standard American tone transmitters; it responds best to a tone of 400-1000 hz.

The relay actuator described is fashioned from a 50-ohm Deans relay and has ample power for these tiny models. The only mechanical change required is to remove the contact finger and substitute an extended arm. Remove the contact finger from the armature by filing off the rivet heads. The extended arm may be fashioned from a length of 1/16" O.D. brass tubing, soldered to the armature. The actuator and arm length should be adjusted to give the maximum of movement with equal pull in each direction. Construct pushrods from 1/16" sq. balsa with .020 wire ends. The control horns are fashioned from thin aluminum and cemented to the rudder. Install the actuator and linkage before finishing the rear of the fuselage planking. The rudder hinges must be very free but without much slack.

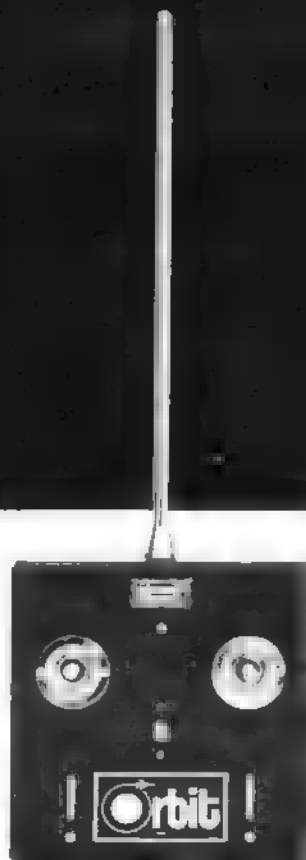
Battery supply is two Eveready S76E 1.5-volt cells. This is a tiny hearing aid cell, and is quite light, cost about 35c. Local drugstores probably stock them. So do large mail-order electronic parts suppliers. For a battery holder, tape the cells together, then tape the hook-up wires to the ends. The leads ends are soldered to washers to make a better contact surface. I usually wrap tightly a small rubber band around the battery pack for additional security. Such precautions are worthwhile.

Use the tiny 1-ct slide switch from World Engines. The antennas on my models have all been vertical whips fashioned from the thinnest music wire. The airborne equipment described works well with most Galloping Ghost transmitters. For the standard

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transmitter, a simple rudder-only pulser is sufficient.

The construction of all my models has been similar. The Sperry Messenger is true-scale in outlines and incidence angles, exceptions to scale being additional dihedral and thrust-line offset. A full-size drawing for the model I built can be found in the March 1968 American Aircraft Modeler. This is Jess Krieser's fine article — a multi-scale Sperry.

My engine has 7 degrees down- and 11 degrees right-thrust measured at the propeller. This means that the engine is mounted above and to the left of the centerline at the firewall. This prevents the nose from taking on a lop-sided appearance and insures a straight, true flight. If the new thrust-line is drawn on the top and side views of the plan, the firewall location for the 010 can be found with —. Just draw

a line perpendicular — the new thrust-line 1.4" back from the propeller location — top and side views.

My fuselage is constructed quite similar to Mr. Krieser's except for wood sizes. The sides and doublers — cut from stiff but light 1/8" sheet balsa and assembled in the same manner. The wing strut system is constructed in the same manner from 1/32" wire, except for the top wing fastening. This is fashioned from small hardwood strips shaped to mate with the scale wing undercamber. These — bound with thread to the top of the wire struts and then securely cemented. The upper wing is later cemented to these hardwood strips. The two strut assemblies should be cemented into grooves in the fuselage-side doublers. I did not use the triplers shown on the plans but, instead, coated the strut mounting areas with epoxy cement.

My landing gear also differs from the plan. The front strut is formed in two pieces similar to the main struts of a Goldberg Falcon to make a torsion-type landing gear. These are bound securely with thread to a small hardwood cross member and cemented in place behind the firewall. The axle is a length of 1/32" wire soldered to the bottom of the front struts. Bind this joint with fine copper wire before soldering. The rear struts are short lengths of radio wire insulation fastened in scale location.

The engine firewall is cut from 1/32" plywood and the engine mounting nuts are cemented to the back side. The only other full bulkhead is located at the rear of the cockpit. Behind this point, there are two 1/16" sq. stiffening strips cemented vertically to each side. The entire top of the fuselage is shaped from soft 1/2" sheet and hollowed out for lightness. The engine cowling and bottom nose block are also shaped from light balsa and hollowed for lightness. (Please use the lightest balsa you can find for these parts or the plane will be too heavy.)

The wings, stabilizer, fin, and rudder were all cut from one sheet of 1/16" x 3" balsa. This sheet of balsa must be quite flat as well as light and stiff. Choose it carefully. The tail surfaces should be flat and, of course, light. The wing airfoil is formed by doping the bottom surface of both wings with clear dope after cutting them to shape and sanding them smooth. When the dope begins to dry, the wings should start curling toward the correct airfoil. As soon as the undercamber reaches 3/32", pin the wings down around the edges to a flat surface and let them dry for 24 hours. When the wings are cut apart, and the dihedral cemented in 4 degrees per panel, the camber will be locked in.

The wing struts should be made from 1/16" x 1/8" hardwood (spruce, etc.), including the

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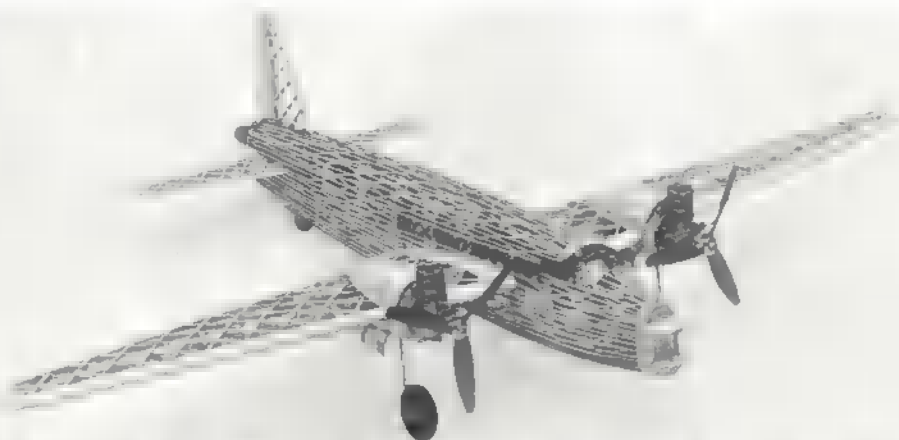
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lift struts shown in the scale drawing. The wings, struts, etc., are cemented firmly in place on my Sperry as this makes a very strong model for the inevitable tumbling around. The large cockpit opening provides access to the radio.

I made my wheels using O-rings for tires (check the plumbing service shops) and balsa disks sandwiched together for hubs. The wheels use three laminations of 1/32" for each hub. The center layer is left flat and the two outer layers are sanded conical. Check the scale drawings for scale shape. Cement a short length of brass tubing in the hub for a bearing to run on the 1/32" axle wire.

The finish on my Sperry is three coats of clear dope, lightly sanded with one coat of color on the wings and tail, and two coats of color on the fuselage. It is painted to simulate the prototype Sperry: Silveir aluminum on the nose panels with mahogany brown on the rest of the fuselage. I cheated on the wings and tail and painted them yellow for visibility. Finishing Touch decals complete the model.

The model is not easy to hold for launch and it does not exactly soar in the glide. I glide-test it on soft, deep grass or weeds. If the model balances at the point indicated, and the weight does not exceed 2 1/2 ozs., it will fly! The glide should be smooth and straight without any sign of stalling or diving. Any necessary trimming may be accomplished by bending the elevator as necessary. The rudder moves about 1/4" each side of center, giving a very smooth positive turn without wobbly flight tendencies of a more sensitive model. For first flights, use short engine runs with a low motor setting. The model is amazingly slow and realistic in flight. As a result, it is quite easy to fly.

The Corben Super Ace is constructed in much the same manner. It has 1/32" basic fuselage sides and bottom with soft block

balsa hollowed out for the entire fuselage top and cowlings. The tail surfaces are also cut from light 1/32" sheet. However, the wing has a built-up construction to keep the weight down. My model has a span of 19.5" with a chord of 3.3". It is scaled from a drawing in a Sept., 1956 Model Airplane News, and is 1.5 times as large as the magazine plan. The method of scaling up the drawing is quite simple. You could also build one directly from Bud Atkinson's model in the June 1967 American Modeler.

Using the machinist's ruler, the necessary dimensions are taken from the plan and multiplied by 1.5. The only necessary drawing is a basic wing framework drawing. Most of the parts are laid out on the balsawood. The engine thrust-line angles are seven degrees and zero degrees from the airplane centerline that intersects at the propeller location, and then move back 1.4" to locate the firewall.

I fastened the firewall to the bottom nose block which is glued securely to the main fuselage. The top half of the nose block is a removable cowlings lightly cemented in place. To gain access to the engine mounting, simply cut the cowlings free with a thin razor blade. I give the entire inside of my cowlings a coat of thin epoxy glue which very effectively fuel-proofs against oil soaking. The radio access hatch is on the bottom because of the unusual shape of the fuselage top. Again, lightly glue the hatch in place and cut free with a razor blade when necessary.

The wing has 1/32" ribs with a 1/8" sq. leading edge and 1/8 x 1/4" spar. The trailing edge is 1/8 x 1/2" triangle stock. The wing should have about four degrees dihedral in each side, and is covered with fine white tissue, along with the rest of the model. A few coats of clear dope should give a nice base for spraying a color finish. The pigmented dope must be applied as lightly as possible to prevent excessive weight. My

Corben has silver wings and stab, with a red fuselage and fin.

The wheels are lightweight wooden painted for realism. Rubber wheels would be far too heavy. My Corben balances 30% of the chord and weighs 2.6 ozs. This gives a very gentle performance. The rudder should be set to move about "1/16" each side of center. This gives ample turn. Again, glide the model into soft grass and bend the elevators until the glide is nice and flat. Due to the monoplane efficiency, this model will have a very flat, reaching glide and requires very little power to fly in a realistic manner. Be especially cautious in test flights not to set the engine for too much power because the speed really builds up in a dive.

I have all kinds of ideas for the future. For instance, how about a tiny low-wing WWII fighter scooting realistically about the sky? Grabs you, doesn't it?

Editor's Note: Mini-Scale models for rudder-only light-weight gear which can be built from plans as printed in recent American Aircraft Modelers are listed as follows. Use the same techniques as Dave Robelen has outlined for the Sperry Messenger and Corben Super Ace. Stits Flut-R-Bug May '67, Mooney Mark 21 May '68, Porterfield June '68, JN4D Jenny Sept. '68, Stits Playboy Oct. '68, Junkers D-1 Nov. '68, and Piel Emeraude April '69.

WEIGHT TABLES

Sperry Messenger (complete)	71 Grams
Corben Super Ace (complete)	78 Grams
Miniature Esquire (complete)	65 Grams
Cox .010 with restrictor	■ Grams
Bentert Receiver	4 Grams
Albin Receiver	6 Grams
Bentert Actuator	9 Grams
Deans Relay Actuator	9.5 Grams
Two Eveready S76E Cells	4.7 Grams
World Engines 1-ct Switch	.9 Gram

Voltswagon

Continued from page 43

volt one for a total of 18 volts.

The motor used is the Mabuchi FT-36D, marketed by Revell, Cox, and others under various trade names. Use the photos and drawings as a guide for choosing the correct motor. Other motors have flown in different models, ranging from the tiny-size Mabuchi to the big Tradeship and MPC Dyno-Chargers.

Since the Voltswagon was built many much more advanced types of high-torque motors have become available. With one of the newest slot-car racing motors an armature rpm of over 70,000 is not uncommon. Torque is tremendous and current consumption high. Again, use of low-pitched small-diameter props will let the motor turn up efficiently. Or you might try a simple gearing arrangement, so that the propeller turns at only 15,000 rpm while the motor is turning at 30,000 rpm. Be sure to have adequate cooling available since more power means more heat. With gearing, more pitch and/or diameter can be used.

Having secured your motor, power-pack, and materials, start construction of the pylon. A first-class approach will pay dividends. (This might also be an excellent club project.) The most exacting portions of the pylon are the head and brush holder; study the drawings and photographs carefully. The head consists of inner and outer slip-rings made from 1/8" and 1/4" brass tubes. Cut the outer ring 1/2" long and solder into a hole in a sheet-metal bracket. Cut the inner ring one in. long and solder a small wire lug around the lower end. Insulate the inner ring with paper or fiber disk just above the lug. Wrap it with Scotch Tape until it is a snug fit in the

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outer ring. Fit the two rings together and cut off any excess tape. Lightly sand both rings to get them clean and bright.

The prototype brush-holder was sawed, drilled and filed from 3/8"-thick Plexiglass. Other insulating materials should work as well. Drill a hole for the smallest slip-ring first, then the larger one, letting the smaller hole guide the drill. Depth is not too critical in the larger hole. You will probably find that scraping or sanding inside the holes is needed to obtain a free running fit on the pylon head. File the grooves for the brushes to intersect the slip-ring holes. Drill 1/8"-dia. holes for mounting brushes in the grooves. Make the brushes from 1/32"-thick brass. Make them smooth, bright and free from rough edges. Assemble the brushes to the brush-holders with 4-40 screws and double nuts. Fit to the pylon head. Bend, twist and file as needed

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until the brushes make good contact with slip-rings.

Fit a small long-shanked eyelet to the inside diameter of the inner slip-ring. Pinch the shank slightly out of round to make it a tight fit within the slip-ring. The eyelet serves to hold the brush-holder down and provides a smooth, rounded surface for the elevator control line to pass. If you obtain the eyelet, solder a small washer to the upper end of the inner ring and smooth off the edges as much as possible to minimize chafing the elevator control line.

To make the pylon structure, fasten a sturdy 2'-long wooden post to a piece of plywood at least 15" square. This joint takes a beating so use strong glue and at least two husky screws. You may wish to equip it with guy wires if doubtful about the integrity of the joint. Mount the head on the upper end of the post with screws. Finish off by connecting about ten feet of lamp cord or other two-conductor insulated wire to the pylon head. Solder or crimp one lead to the lug on the inner slip-ring. Connect the other to the pylon head mounting screws. Tape or tie the wire close to the post.

Install a small screw-eye in the base very close to the bottom of the post directly below the pylon head. Use light nylon, dacron or linen cord for the elevator control line, feeding it through the pylon head and the screw-eye with a swivel installed between. At the pilot's end of the string, pass it through a small hole in the end of a piece of hard cardboard or sheet plastic about 3 x 6". An eyelet in this hole will reduce friction. This is used to keep the line close to the floor, and prevents accidental "carrier landings." Then tie a ring or bar to the end for a hand-grip. A small wire hook tied to the upper end of the string serves as attachment to the airplane.

Obtain a length of light double-conductor stranded wire. Number 24 speaker cable is suitable. Cut the length needed for the airplane leads. Five feet is suggested. Three feet can be used and as much as 15 feet is possible. Split and strip the ends and attach small wire lugs. Make sure the lugs grip the insulations as well as the conductors or the wires will fatigue and break. Hook up one end of the wire to the screws that hold the brushes.

Construction of the airplane is straightforward with only a few points worthy of special mention. The propeller mounting is one. The recommended method is to use a brass No. 10 machine screw drilled through the center as an adapter. Solder it to the motor shaft. This drilling is easily accomplished with a metal lathe, but is nearly impossible otherwise. Any small machine shop should be able to drill out a screw at little or no cost. A good prop to use is 5 1/4" diameter by 4 pitch Topflite, drilled to fit, and clipped to 4 3/4" inch diameter to avoid a motor overload.

The spinner can be made from a balsa block, using your motor as a lathe for finish sanding. Force the adapter into a hole in the rough-carved spinner and sand with very light pressure. Blow sanding dust out of the motor frequently to prevent overheating. Cut a cavity to fit the prop hub and notches for the blades. To mount the spinner dead true, cut an accurate disk from fiber or light cardboard with a hole in the center fitting the No. 10 screw. Fit this behind the propeller and cement the spinner to it.

Make the "engine room" by tracing off and cutting out a pair of doublers, a firewall and a shelf from 1/4" hard balsa. Don't skimp on the holes in the shelf and firewall. These motors release a lot of heat, and need every bit of cooling air they can get. As-

semble these parts as shown on the drawing. Add cross blocks to the shelf, notching them to fit the front and back ends of your motor. Fit wire hooks fore and aft for a rubber-band motor hold-down.

Make the fuselage sides from medium 1/16 sheet balsa and cement to the motor mount assembly. Add formers, then sheet in the underside from the tail to the wing trailing-edge position. Make sure the two side planks do not come quite together at the rear. A 1/4" gap is about right. Cover the upper portion of the fuselage with 1/32 sheet. Make an engine hatch with two 1/8 sheet formers, and 1/32 sheet covering. Hinge the hatch to the fuselage with a bit of Silkspar. Make sure the hinge is on the left side of the airplane so that centrifugal force will hold it closed. Form the landing gear strut from 1/16 music wire and mount the firewall. Finish off the fuselage by fitting a 1/4"-thick block to the underside of the cowling, whittling and sanding to shape. Go over the completed fuselage with sandpaper and dope, then cover with tissue. Carefully cut the engine hatch open. A tail wheel (from a plastic model) adds a nice touch.

Cut the tail surfaces from 1/16 sheet. Form a control horn over the drawing. A paper clip works fine. Cement the control horn to a notch in the elevator. Hinge the elevator to the stabilizer. A spanwise strip of Silkspar on the top only serves this function since the elevator will be pulled up only, not down. Affix a hook to the bottom of the stabilizer and fit a very light spring or rubber band between the hook and the lower loop of the control horn. Use some of the same cord you used on the pylon for the elevator control-line. Route the control-line from the control horn through a hole into the fuselage, through a wire loop fastened to former F-1, and out through the hole in the left side of the fuselage over the wing. Alternatively, the line can be run outside the fuselage.

Wings are of standard construction using 1/16 ribs, 1/4 sq. leading edge, 1/8 x 1/4 spar, 1/2" trailing edge stock, and 1/8 sheet tip bows. Run 1/16 of the speaker wire from center to tip of the left wing through notches in the ribs. Solder paper-clip wire terminals, formed as shown on the drawings, to the tip end of the wire. These should snap into the lugs on the electric line, and firmly grip the lugs tightly for safety and conductivity. Cement these solidly to the tip bow.

The wing may be built flat in one piece if desired. However, the dihedral shown looks good in flight and minimizes chances of bashing a wing tip. Splice the wing wires to the motor leads within the fuselage, taping at least one of the splices. Add a small wire line guide to the last rib of the left wing after covering.

Finish off your Voltswagon with 1 1/4" wheels, a pilot carved from foam plastic or balsa, and a windshield. The original was covered with white Jap tissue, with blue tissue trim on the upper fuselage, blue tissue lettering and red dope trim on wings, fuselage, sides and fin. The model should balance somewhere between the leading edge and the spar for smoothest performance.

Hook up power-pack and throttle control as shown on the diagram; hook up wires and control cord to the plane. Tape the card at the end of the cord to the floor outside the flying circle. Try a bit of power to see if the prop rotates correctly. Don't forget to weight down the pylon with at least ten pounds. There half-gallon bleach bottles filled with water will do. Don't forget to walk the plane around the circle to check for obstacles. If no amount of juggling of the pylon lines will leave you a clear flying area, you can shorten the flying

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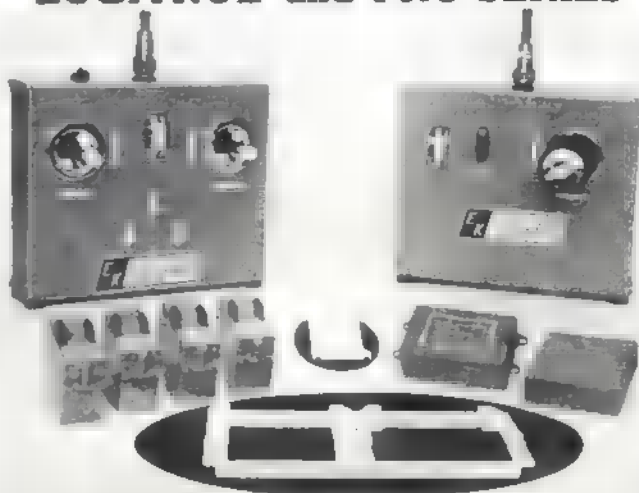
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The Academy of Model Aeronautics, in Washington, produces the mailing tapes which are used by the printer, in Milwaukee, to mail magazines. By mistake, despite tapes being produced properly, some AMA and NAR members did not receive the June issue of AMERICAN AIRCRAFT MODELER but were sent two copies of the July issue instead. Those affected who still wish to receive the June issue should advise AMA HQ. Enclose the address label from this issue (August) and write on it "NO JUNE — SEND SAME."

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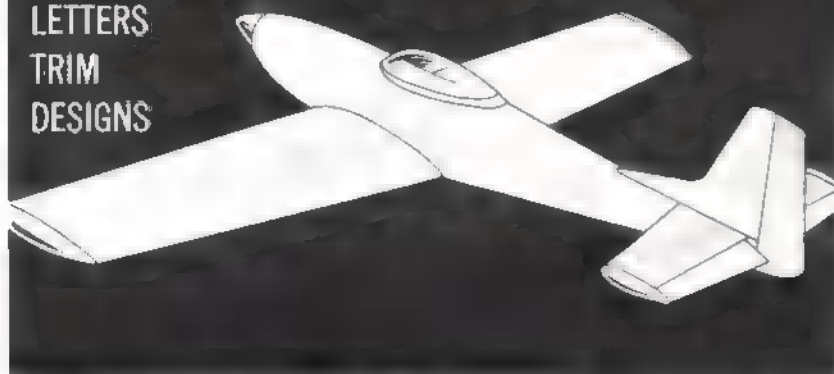
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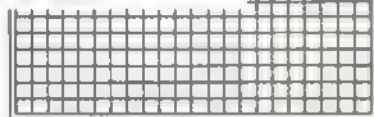


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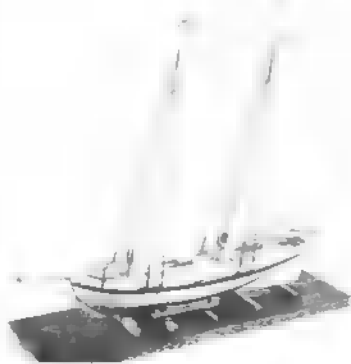
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radius by knotting the power line shorter.

Grip the throttle control in one hand, the control line in the other. Leave the control line a little slack. Add power gently. Volts-wagon should roll easily with the tail coming off the ground quickly—then a smooth takeoff. If you have made a low enough powered takeoff, the plane will be flying in a horizontal circle.

Most of the time you should fly with no elevator control applied. Light, quick pulls and releases of the control line can be used to level the flight path. For your first few flights, strive to master the art of level flight. When this has been accomplished, try a fully stalled flight; ease power up to full, simultaneously easing up to full elevator. You will be treated to the spectacle of a slow, stately nose-up flight. To recover, ease off throttle while holding elevator, and land the plane; or ease off the elevator while holding full throttle to return to level flight.

Try this: fly level at full throttle. Allow several laps to gain speed. Hit and release the elevator, but be ready to hit and release again the other side of the circle to recover from the dive.

Landings? Simplicity itself. From level flight, either chop the throttle or ease off. Volts-wagon will land itself. Or, flying full speed, chop the throttle, ease in full elevator and drop it in. A bit of elevator at touchdown may be needed to avoid a nose-over if you are flying from a carpet or a rough surface.

Editor's Note: Some of the apparatus described in this article is the subject of patents pending. The Kenner Products Company, holder of the rights to this material, has kindly agreed to release it for construction and use by individuals for their own amusement, but reserves all other rights.

Plane and Space

Continued from page 31

a lifetime battling against the same perennial winner who happens to be in their division.

Dr. Paul E. Garber, U.S. aviation historian for the Smithsonian Institution's National Air and Space Museum, served as chief judge this year as he has for numerous shows in the past.

Dr. Garber says the show is one of the best sources in the nation for meeting skilled modelists capable of building projects suitable for exhibit at the National Air and Space Museum in Washington, D.C.

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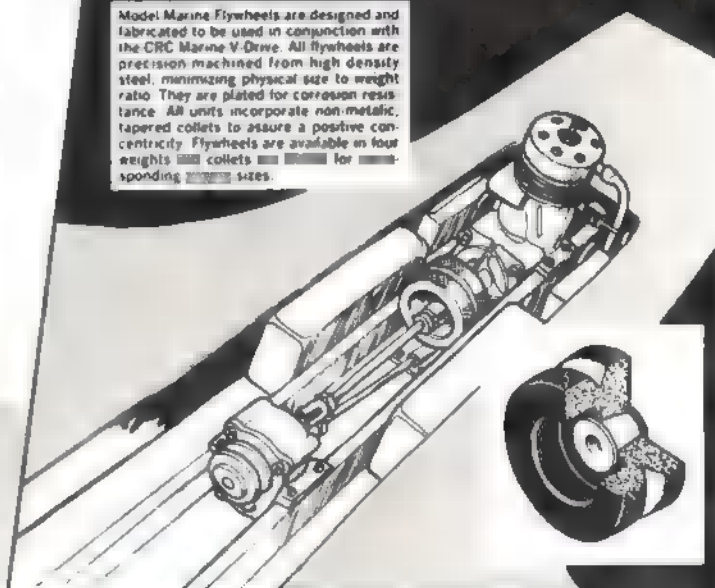
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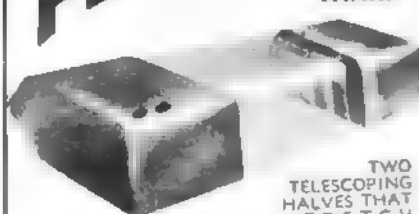
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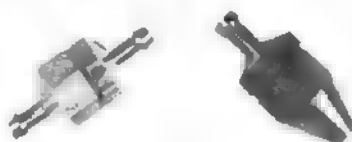


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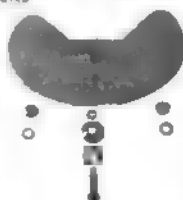
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R/C Editorial

Continued from page 34

deep scratches — cracks). If the prop maker says to boil your props, do it — though we still emphatically agree with the above club paper editor's comments on this matter. Maybe we should all wear hard hats and safety goggles in the pit area!

We believe the AMA has been collecting authenticated reports of broken prop incidents (if you have details of any, send them to headquarters). The view of the seriousness of the situation it seems this material should be made available to the manufacturers as soon as possible — and also to the consumers who, after all, are the ones likely to be clobbered by a broken prop blade!

From Top Flite Models, Inc.

First, I want to thank you for letting us read McEntee's editorial before it goes to press. I doubt that all publishers would do this for a manufacturer — order to at least let him know what is to be said and offer the opportunity to answer any comments — add information that be of benefit to the consumer.

This Nylon propeller problem is not a one and we, as leaders in this field, very much aware of this and have been working

it for several years. The matter involves not only the boiling of props to put moisture back into them, or the cold weather which does make them more brittle, but also that a big contributor to the problem is vibration and centrifugal forces that work on a propeller. The one thing that makes Nylon almost ideal for a propeller, that it will last for many flights, is its flexibility — landings; and yet this is the thing that works against it. This flexing takes place when the engine is running and the airplane is flying and, together with centrifugal force, causes stresses. In some cases blades will be thrown.

We have been working with many other materials, such as fiber-filled Nylon, Lexon, Delrin, and many others, but none has been successful. However, we have not given up on this problem. Our aim is to make a propeller that is strong enough to withstand rough landings, light in weight to reduce centrifugal force and rigid enough to prevent vibration that causes stress cracks.

The only material, thus far, that is satisfactory in all these requirements is wood, with one exception, and that one exception is bad landings. But isn't it much safer to break a prop on a bad landing than to lose an airplane, or more seriously, an eye because of the blades flying off? Wood has the quality of being rigid, can withstand a tremendous amount of vibration without fatigue, and the tensile strength to withstand the centrifugal forces induced in a propeller.

Well, I hope I have been of some help. We are working constantly on this and if anyone has any ideas how this problem can be solved we would appreciate any suggestions for, above all, safety is our first concern. — Sid Axelrod.

Model Rocketeer

Continued from page 40

sis was placed in the group last September... MDRA's newsletter "Misfire" edited by Vic Cross and printed by Juanita Severe presents news from members, construction hints, a contest calendar, and model plans... item which impressed us recently was mention of hobby dealer Mark Fleischman of Denver who makes a special effort to assist rocketeers with items needed on-the-spot — section contests, etc... perhaps if your section invited out (set up an agreement, that is) a similar local type, he would: 1) have an automatic display for you, 2) answer questions of visitors, 3) anticipate and order items ahead, 4) publicize your section downtown, and 5) furnish some worthy prizes too!

Contest Calendar

Continued from page 52

- Indian City RC Meet. Site: Allen & Pennsylvania, E. Lynn CD. 3167 23rd St., Wyandotte, Mich. 48192.
Aug. 2-3 — Tacoma, Wash. (AAA) Jim Walker Memorial FP Meet. Site: Hart's Lake Prairie, J. Shafer. 5720 122nd Ave. S.E., Bellevue, Wash. 98005.
Aug. 2-3 — Winchester, Tenn. (AAA) Tenn. State Championship Meet for FF CL & RC. Site: Airport, L. Webster CD. 1000 Sycamore, Manchester, Tenn. 37355.
Aug. 3 — Field, Wisc. 1971 FAI FP Qualifying Trials. P. Sotich CD. 3851 W. Pl., Chicago, Ill. Sponsor: Illinois Model Aero Club & Chicago Aeroclubs.
Aug. 3 — Sharon, Pa. (AA) Skylarks 3rd RC Jam-toree. Site: Club Field. G. Ennot CD. 1077 March St., Sharon, Pa. 16146. Sponsor: Skylarks.
Aug. 3 — Alton, Ill. (AA) Illinois Metro-East Model Airplane CL Contest. Site: Civic Memorial Airport, J. Blum CD. 2417 Glen Pl., Granite City, Ill. 62040. Sponsor: Tri City Sky Stealers & Alton Area Thunder Bolts.
Aug. 3 — Denver, Colo. FAI FP Qualifying Trials. Site: E. Colfax Air Park. E. Collins CD. 4318 E. Utah Pl., Denver, Colo. 80222. Sponsor: Magnificent Mountain Men.
Aug. 3 — Wichita, Kans. Wichitahawks Flying Circus. Site: Wichita Modelers Council Field. J. Finley CD.

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5217 E. Murdock, Wichita, Kans. 67215. Sponsor: **Wichita**.

Aug. 3 — Dunkirk, N.Y. (AA) 2nd Annual Fun Fly for RC. Site: L&A Field. ■ Hemenger CD, 1031 Central Ave., Dunkirk, N.Y. 14165.

Aug. 3 — New Bedford, Mass. (AA) Classic for CL. Spec. Jr. Event. Site: Airport. L. Oadomski CD, 158 Richmond St., New Bedford, Mass. 02740. Sponsor: **New Bedford MAC**.

Aug. 3 — Grand Junction, Colo. (AA) 2nd Annual CL Contest. Site: Lincoln. ■ Kirkham CD, 288 Hill Ave., Grand Junction, Colo. 81501. Sponsor: **Grand Junction Modelers**.

Aug. 9-10 — Jacksonville, Fla. (AA) Jacksonville RC Meet. Site: Herlong Airport. ■ Pierce Jr. CD, 308 W. Forsyth St., Jacksonville, Fla. 32202. Sponsor: **Jacksonville RC Club**.

Aug. 9-10 — East Granby, Conn. (AA) Englewood RC Championships. Site: NCRCC Field. A. Bachand CD, 33 Carver Rd., Framingham, Mass. 01708.

Aug. 9-10 — Freeland, Mich. (AA) Saginaw Valley RC Annual. Site: Lone. ■ Gill CD, Lone Rd., Freeland, Mich. 49823. Sponsor: **Saginaw Valley RC Club**.

Aug. 10 — Lancaster, Ohio **FORKS** Fun Fly. Site: Whitley Road S.W. J. Slater CD, Box 489, Lancaster, Ohio 43130. Sponsor: **Fairfield Ohio Radio Control Society Inc.**

Aug. 10 — Cincinnati, Ohio (AA) Tri-State CL Championships. Site: Lunken Airport. D. CD, 2403 Downing Dr., Cincinnati, Ohio 45216. Sponsor: **Exterminator Combat Team**.

Aug. 10 — Sioux Falls, S.D. (AA) Sioux Empire Model Airplane Championships CL Meet. Site: Fall Grounds. ■ Donovan CD, Thompson Dr., Sioux Falls, S.D. 57105. Sponsor: **Flying Eagles Model Club**.

Aug. 10 — Hempstead, N.Y. (AA) LIAMAC Annual Invitational CL Contest. Site: Mitchell Field. W. Dunwoody CD, Ft. Salonga Rd., Northport, N.Y. 11763.

Aug. 10 — Denver, Colo. (A) MMM Monthly Outdoor FF Meet. Site: Prop Busters' Field. ■ White CD, 1373 Bellaire, Denver, Colo. 80202. Sponsor: **Magnificent Mountain Men**.

Aug. 10 — Hastings, Minn. (AA) Mpls. Annual Silent FF Meet. Spec. RC Event. Site: Webers Airport. H. Langevin CD, Aldrich Ave. S., Minneapolis, Minn. 55419. Sponsor: **Minneapolis MAC**.

Aug. 10 — Cleveland, Ohio (AA) Jr. Air Races for FF. Site: City Field. R. Klueber CD, Lakeland, Lakewood, Ohio 44107. Sponsor: **NOFA**.

Aug. 16-17 — Converse, Ind. (AA) 2nd Annual Converse RC Fly Club. Site: Airport. W. Hutchins CD, 122 N. Munson, Portland, Ind. 47371. Sponsor: **Converse RC Flying Club**.

Aug. 16-17 — Marietta, Ga. (AA) Marietta Annual RC Meet. Site: Cobb Co. RC Field. L. Johnston CD,

1021 Church ■ E-E-3. Smyrna, Ga. ■ Sponsor: **County RC Club**.

Aug. 16-17 — Omaha, Nebr. (AA) 16th Annual RC Contest. Site: Club RC Flying Site. R. CD, 11720 Cedar St., Omaha, Nebr. 68148.

Aug. 16-17 — Shakopee, Minn. (AA) 13th Annual TCRC Meet. Site: TCRC Field. J. Duncan CD, ■ Rd., Minnetonka, Minn. 55343.

Aug. 16-17 — So. El Monte, Calif. (AA) Contest for RC. Site: Whittier Narrows. B. Garabedian CD, ■ N. 3rd St., Montebello, Calif. 90640. Sponsor: **San Gabriel Valley RC**.

Aug. 16-17 — Odessa, Tex. (AAA) Odessa-Midland 13th Annual RC Contest. Site: Ector Airport. L. Hood CD, ■ O. Box ■, ■ Tex. ■. Sponsor: **Prop Busters of Odessa**.

Aug. 16-17 — Endicott, N.Y. (AA) 14th Aeroguidance Society RC Contest. Site: Tri-Cities Airport. R. Noll CD, ■ Pine Knoll Rd., Endicott, N.Y. 13760. Sponsor: **Aeroguidance Society, Inc.**

Aug. 16-17 — Baton Rouge, La. (AA) Baton Rouge RC Club 8th Annual RC Meet. Site: Klempner Field. L. CD, 1739 St. ■, Baton Rouge, La. 70801.

Aug. 17 — Oklahoma City, (AA) Central CL Championships. Site: Topping Park. ■ N. Hwy ■. M. McGee CD, 1805 N. Tulsa, Oklahoma City, Okla. 73107. Sponsor: **Oklahoma City Controllers**.

Aug. 17 — Flushing Meadow Park, N.Y. (AAA) Assoc. of MAC of Greater N.Y. CL Meet. Site: Model Airfield. W. CD, 145-74 St., Laurelton, N.Y. 11413.

Aug. 17 — Aurora, Colo. ■ Museum ■ Timer Fall Meet. Site: E. Colfax Air Park. ■ Schlem CD, ■ S. Franklin St., Englewood, Colo. 80110. Sponsor: **Model ■ Club**.

Aug. 17 — Lincoln, Nebr. (AA) Aero Design Summer for CL. Site: ■, ■ W O Street. J. Mock CD, 851 N. ■, Lincoln, Nebr. 68502.

Aug. 17 — St. Louis, Mo. (AAA) 11th Annual Mid-■ Championships. Site: Buder Park. ■ Flying Field. A. Schaefer CD, ■ Virginia Ave., St. Louis, Mo. 63111. ■ St. ■ Yellow Jackets.

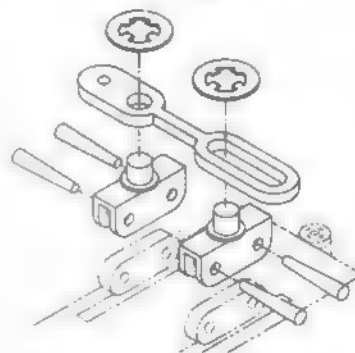
Aug. 17 — Green Bay, Wis. August Fun Fly for Spec. Fun Events. Austin Straubel ■ R. Cowles Jr. CD, 2424 Ducharme ■, Green Bay, Wis. ■. Sponsor: **Green ■ RUF Club**.

Aug. 17 — Canton, (AA) Canton RC Club Meet. Site: Sherr ■ S.E. Club Field. G. Villard CD, 3301 ■ St. N.W., Canton, Ohio 44705.

Aug. 23-24 — Orange, (AA) New England RC Championships. Site: Orange Municipal Airport. ■ Bachand CD, ■ Rd., Framingham, Mass. 01701.

Aug. 23-24 — Decatur, Ala. (AA) 4th Decatur MAC Annual RC Contest. Site: Courtland Air Base. E. Minter CD, 2317 Calumet Ave. S.E., Decatur, Ala. 35601.

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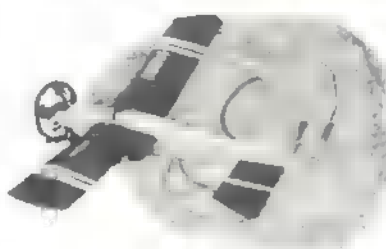
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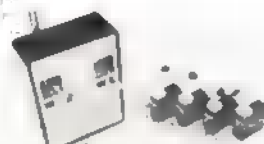
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Aug. 23-24 - St. Charles, Mo. (AA) McDonnell Twelfth Annual RC Meet. Site: Conduction Corp. W. Feldmeier CD. 2955 Clearview Dr., Normandy, Mo. 63121. Sponsor: McDonnell RC Club.
Aug. 24 - Chardon, Ohio (AA) CRC 7th Annual RC Pattern Contest. Site: Club Field. ■ Vidmar CD. ■ Zeman Ave. Euclid, Ohio 44132.
Aug. 24 - Bong AFB, Wis. (A) Flying Fools-NIAMACS FF Meet. J. Samuels CD. 337 S. 8th St., St. Charles, Ill. 60174.
Aug. 24 - Cincinnati, Ohio (AA) Queen City U-Control Meet. Site: Lunken Airport. J. Ballard CD. ■ 19 Bona Vista, Cincinnati, Ohio 45213.
Aug. 24 - Fortville, N.Y. (AA) RC Pylon Meet. Site: 1 Mi. So. on Rt. 445 adjacent to gravel pit. G. Flynn CD. Rt. 2, Box 456, Olean, N.Y. 14780. Sponsor: Olean MAC.
Aug. 24 - Wichita, Kans. (AA) Wichitahawks 2nd Annual Fall Rally for FF ■ CL. Site: Wichita Modelers Council Field. J. Mason CD. 2214 ■ Pinecrest, Wichita, Kans. 67218. Sponsor: Wichitahawks.
Aug. 24 - Canton, Ohio (AA) Small Field Fun FF Contest. Site: Frace Farm. D. Assel CD. 1012 Milford St. N.E. Canton, Ohio 44714. Sponsor: Canton Model Airplane Society.
Aug. 24 - Johnsville, Pa. (AAA) Eastern States Championships for FF. CL ■ RC. Site: NAF. R. Leishman CD. 167 Goldenridge Dr., Levittown, Pa. ■ Sponsor: Levittown Flying Bucks.
Aug. 30-31 - Memphis, Tenn. (AA) Memphis RC Club Meet. Site: Club Field. L. Hord CD. 5050 Poplar. Suite 319, Memphis, Tenn. 38117. Sponsor: Memphis RC Club.
Aug. 30-31 - Three River, Mich. (AA) 9th Annual RC Multi Contest. Site: Airport. C. Groves CD. ■ Washington Ave., Kalamazoo, Mich. 49001.
Aug. 30-31 - Madera, Calif. (AA) West Coast RC Championships. Site: Airport. ■ Francis CD. 1225 Buchanan. Santa Clara, Calif. 95051. Sponsor: Pioneer RC Club.
Aug. 30-31 - Indianapolis, Ind. (AA) Indianapolis RC Meet. Site: Indpls. RC Flying Field. ■ Goad CD. 10906 Willowmere Dr., Indianapolis, Ind. 46280. Sponsor: Indianapolis RC Club.
Aug. 30-Sept. 1 - Bong Field, Wis. 1971 North-Central Area FAI ■ Semi-Finals. ■ Sotich CD. ■ W. 62nd Pl., Chicago, Ill. 60629. Sponsor: Illinois Model Aero Club ■ Chicago Aeromats.
Aug. 31 - Chicago, Ill. (AA) Illinois Iowa Aeronautical Assn. CL Meet. Site: Cook County Forest Preserve. ■ Johnson CD. 6810 S. Crandon, Chicago, Ill. ■
Aug. 31 - Fresno, Calif. (A) Fresno Monthly FF Contest. Site: Near Kerman. F. Gallo CD. 1725 Kenmore. W. Fresno, Calif. 93703. Sponsor: Fresno Gas Model Club.
Aug. 31 - East Meadow, L.I., N.Y. (AA) NAQS Annual RC Meet. Site: Mitchell Field. M. Palumbo CD. 201 Martin Dr., Syosset, N.Y. 11791.

Taylor Cub

Continued from page 26

the wingtips. Make four U-hooks, push into the rib at the proper location, and glue. Apply a light water-spray to all covered parts, let dry. The covering should shrink to a tight, smooth surface. Apply two coats of clear dope to entire model. Take off any fuzziness or sharp edges with very fine sandpaper.

Details: Bend the tail skid to shape, push ■ fuselage frame, and glue. A triangular piece of bond paper is folded over the front landing gear wire, and edges glued to the rear l.g. wire to make a cover. Use $\frac{1}{16}$ rubber cord and tie in place to simulate the shock struts; use rolled paper for shock covers.

Make two dummy engine cylinders from balsa, simulate cooling fins with $\frac{1}{32}$ aluminum wire glued to the cylinders. Glue cylinders in place on the lower cowl block, add pieces of $\frac{1}{32}$ aluminum wire for the intake and exhaust pipes. The wing struts ■ made on the plan, but leave the jury struts until they can be cut and fitted while the struts ■ in place on the model. Solder washers on the ends of the l.g. axles to hold ■ the $1\frac{1}{4}$ " wheels (Trexler #1 airwheels look great).

Paint the cabin interior Cub Yellow, add an instrument panel and pilot if you wish (1" scale), then cut out the celluloid windshield and windows, fit, and glue in place. Make a fuel ■ from a balsa washer and a pin. Pass a monofilament line through pinholes in the tail, and glue to fuselage bottom to simulate the tail brace wire. One detail that is often overlooked, is to paint up a prop to simulate the full-scale one.

Finishing: The author's model was painted Cub Yellow with Curtiss Blue trim; but,



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since Cubs have been painted and repainted over the years, almost any color would do. Possibilities are: Cub Orange with Black trim, White with Blue trim, or Cream with Red trim. Give the model three coats of dope in the finish colors.

Decals can be used for wing and rudder numerals (and for trim stripe and detail lines), but a neat job of painting them on makes the model more authentic. Wing numerals can be Black or trim color, rudder numerals White or background color, while the Cub insignia is Yellow. Engine cylinders are Black, as are aileron, rudder, elevator, and detail lines. Paint on cabin roof window on the wing with Sky Blue dope. Wheel hubs are Aluminum. Protect the decals and celluloid with a coat or two of fuel-proof clear dope.

Flying: The model must balance at the point shown on the plan. If not, add weight to nose or tail (glue lead buckshot inside cowl, or inside fuselage above tailskid until balanced). The wing, stabilizer, and rudder must be without noticeable warps, and must be aligned in accordance with the plan. Warps can be easily corrected by holding the warped part in the jet of steam from a boiling kettle for a few seconds until pliable, then twisting to the correct position until cool. Repeat if necessary.

Remove the wing struts while test flying; they are not necessary for flight and are difficult to repair. On a calm or near-calm day, test glide your model over long grass to cushion the landing. Hand-launch it into whatever breeze there is — a slightly downward path to a point about 25 feet in front of you. If the model stalls, bend the rear of the stabilizer surfaces down $\frac{1}{16}$ " and try again. If a dive results, bend up slightly. Or the model may just slow down slightly, then drop off to one side — check for wing warp and correct it.

In order to keep your model in the ballpark, both glide and power flight need a turn adjustment to make it circle. With the rear of the rudder bent $\frac{1}{16}$ " to the left, the author's model flew in 100'-diameter circles to the left while under power, and larger circles to the left while gliding. Once the glide is satisfactory, and you have run the engine enough to be familiar with its operation — with the engine running smoothly and about 15 seconds of fuel remaining — hand-launch the model on a level flight path into the breeze.

A Top Flite $5\frac{1}{4} \times 3$ prop — used for flying. The model should have a gradual climb with a circle to the left. Down-thrust is built into the model to compensate for the speed/lift variation between powered flight and gliding, but it may be necessary to add more down-thrust if your model power stalls, or goes into a series of mild power stalls. If the model turns or banks too sharply to the left, correct by pointing the engine slightly to the right. These adjustments are easily accomplished by inserting washers between the engine and the firewall at the proper corners. Generally speaking, adjustments to the power-on flight should be made by working with the engine thrust-line setting, thus leaving the glide adjustments undisturbed.

The Cub is meant for flying, so experiment with the flight adjustments until your model performs well. Takeoffs and landings are realistic from flat surfaces. One word of caution: limit the amount of fuel in the tank or be prepared for some hiking. Questions or comments should be directed to me: Box 132, Newfane, Vermont 05345.

Best of luck and happy landings!

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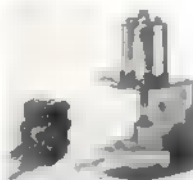
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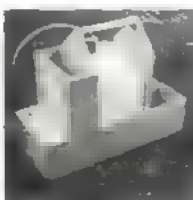
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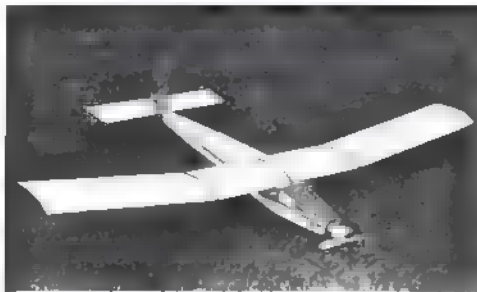


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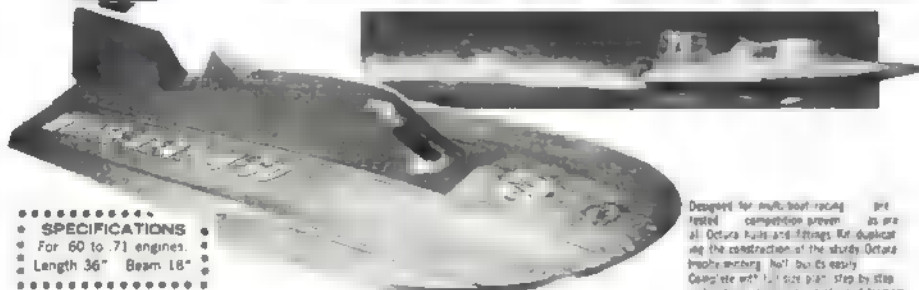
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Continued from page 17

Not until 1967 did Pete's Pietenpol project get hot. While at the annual Antique Airplane Fly-in at Merced, Calif. that year, Pete was invited to fly a Model-A powered Air Camper built by Dallace Williams of Planada, Calif. This was an almost-pure 1933 model, with marginal performance by current Cessna and Piper standards, but a delight to fly. With this experience behind him, Pete couldn't wait to get his own in the air. Since his spare time was committed to other projects, he prevailed upon John Sorrell of Rochester, Wash. to complete it.

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Covering went modern, however. Stits Poly-cover (dacron) was used, with butyrate pigmented dope for the finishing coats.

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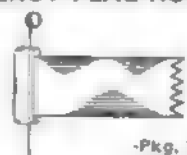


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Since he believes that old-time airplanes should carry old-time color schemes, Pete had his Air Camper painted with Diana Cream wings, horizontal tail, and wheel discs with the remainder Durable Maroon. Careful attention was also paid to the size, location, and styling of the registration numbers, which were black. Pete made a special effort to get a number from FAA that was compatible with the Air Camper's actual — 688Y.

Since the airplane had never been legal and its original identity had been lost, there was little point in registering it as a restored old-timer. Enough new parts had been built for the FAA to license it as a new amateur-built, and paperwork was issued to this effect. However, it actually was a restored antique with more original parts in it than many current restorations that virtually new airplanes assembled around old nameplates, and Pete wanted it recognized as an antique rather than a homebuilt. Even though it was actually both, experience in taking other amateur designs of equivalent age to combined antique-homebuilt Fly-ins showed that, even when the plane was older than most factory-built antiques in the field, it was inevitably classed as a homebuilt and judged as such. To get judges and spectators started in the right direction, he had "1930 Pietenpol — restored 1968" painted on each side of the fin. This was supplemented by a short history typed up and installed under plastic in the front cockpit. This approach worked, and Pete's Pietenpol took first place in the class for "Golden Age Monoplanes — 1919-1934," at its first public appearance, the 1968 Merced Fly-in. It made the road-miles from Seattle a trailer, and since it didn't have the area limitations removed because of too few flight hours, it needed special FAA permission to make flights outside its home area.

Because of the extra power of the Model- this Pietenpol has better performance than the other Ford-powered versions and even exceeds some of the 65's in rate of climb and cruising speed (70-75 mph). However, it is pure Pietenpol in most of its characteristics, including general handling and the lack of comfort associated with too-small cockpits from which a long body like Pete's 6'1½" sticks out a long way. With the radiator up front to break the wind, goggles aren't really necessary, even though there are windshields.

That radiator up front is not the visibility problem you would imagine. It is easy to see around when straight-ahead vision is needed and it certainly takes the chill out of the airstream. The pilot knows whether he slips or skids his turns when he feels cool air strike his side of his face or the other. Because of the short length, the Pietenpol is sensitive in longitudinal pitch but is very slow in roll because aileron effectiveness falls off rapidly at low speed. The rudder is small but adequate, and the landing approach and roll-out is a good exercise in fast footwork on the rudder bar (old-fashioned bar in the back seat, pedals in front).

So, in spite of 40 years of aeronautical progress, the old 1928 Air Camper is still with us. It has outlasted many of its critics and demonstrated the relative futility of trying to improve it by substituting modern features and equipment. For those willing to accept what the Air Camper has to offer — uncomplicated 1930's-type flying fun — there is nothing available today that can match its ability to give the most fun for the least cost and effort.

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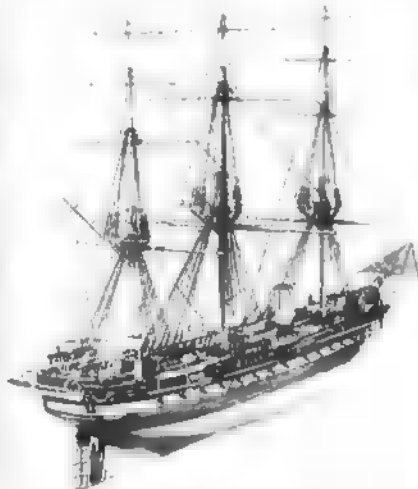
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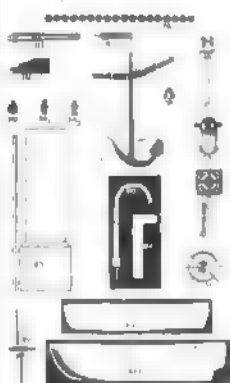
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Tenderfoot

Continued from page 15

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You Said It

Continued from page 11
makes a stand head and shoulders above anything else.

May I tell your readers about my project? The Boys Club of Denver let me borrow seven boys and a room on Saturday afternoons. None of the boys has had any modeling experience but they are long on enthusiasm. Some have tired of the novelty and dropped out, but replacement isn't any trouble as we have a waiting list. And the kids help each other. The older (?) hands help the newcomers. I hope to expand the

class as we develop leaders and then some day become obsolete. Until then, if any of your readers in Denver would like to lend a hand, they are welcome to join the fun.

Just a few simple kits, glue, dope, brush, pins, workboards, etc., and I spent \$40. The money was stretching thin when the Optimist Club of S.C. Denver donated \$100. This was great but it won't last forever.

My thought was if any of your readers have anything in the modeling line that is just gathering dust, they could send it to me c/o The Boys Club of Denver, 3480 W. Kentucky, Denver, Colo.

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J. B. Neil, Denver, Colo.

Hates attacks on fellow modelers

As a junior, I agree wholeheartedly with your April '69 editorial, and I want your magazine to continue its moves in the direction of remedying the lack of rubber-powered scale plans in the major magazines today.

Your "Snork 93" article wasn't too edifying, but it was hilarious. I want to see more of this in AAM in future issues. We modelers are getting into the dangerous habit of taking ourselves too seriously. We need articles like that to remind us that this is essentially a fun sport and hobby, and should be treated as such.

I don't like the magazines being used by some people as convenient vehicles for airing a pet peeve, or for vicious personal attacks on fellow modelers.

I say "each man to his thing." So why don't those people who are always screaming about what's wrong with our hobby sit back and survey what's right with it. You're always going to have differences of opinion! But that's no reason for attacking another modeler's personality.

I may seem a bit heated, but what brings me to this is a very inflammatory personal attack on John Pond (a man whom I admire very much), which really made my helmet jump. This was in an issue of another magazine which appeared several months ago.

I say if a person wants to see an event added to the contest agenda, he should try it out locally to see if it catches on. Then he should go about making it part of the Nats. However, he shouldn't downgrade another event in an attempt to make himself and his pet project look big.

We should remember: "Do unto others as you would have them do unto you." And now it is more important than ever before that we stay unified, or work together, and work hard to improve our image in the mind of the average American. The very survival of our hobby depends on it. This is a fine sport, and we should do our best to live up to it.

Gerald Nelson, Canoga Park, Calif.

Some never heard of R/C

I think junior participation in our hobby is low because of the unawareness of most kids to what the sport is. About 90% of the kids in my school have never seen or heard about R/C. I think that if there was some way to let kids know about R/C and see what can be done with it, the number of juniors in our sport would greatly increase.

The problem of money is an obstacle to overcome, but with a little determination the money can be earned.

I am 15 and have a Micro-Avionics radio and am at present flying a Sterling F-51 Mustang with an Enya 60. I paid for my equipment with the money I earned from two paper routes and being a carpenter's aide. I believe this shows that it can be done.

Steve Ellison, Salem, Oreg.

Not born with silver spoon

First of all let me explain that I have a group of 15 boys working on a 4H project. The project is model building.

You say they are interested? You bet they are! But let's take a look at some of the problems.

I have yet to see in any model magazine,

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a warning to the tyro R/C enthusiast about super-regen receivers. Any of us who have had them know darn well that with all the interference on CB they are worthless.

I know of a case where a lad worked all summer to save up enough money to buy his first R/C rig. You guessed it—he bought a super-regen advertised in one of the model magazines. Needless to say the hobby has lost one more enthusiast.

I realize these ads are your bread and butter, but don't you owe something to your young readers?

Another problem: I recently went into a local hobby shop and bought one sheet of 3/32 x 3 x 36 balsa and two yards of silk. That same sheet of balsa last year sold for 10¢ and it is now 50¢. A yard of silk last year was \$1.25 and now it is \$2. A popular engine two years ago sold for \$3.99 and last year \$4.99 and now \$5.98. A kit that sold for \$8.95 last year now sells for \$11.95.

All I can say to this is that if the manufacturers, distributors, and dealers want to cut a fat hog . . . that's O.K. with me, but with their current prices you can bet they aren't likely to get much business from the kids. And they are the ones who will do most of the buying in later years if they get interested in the hobby while they are young. And they aren't likely to get much repeat business from those of us who weren't born with a silver spoon in our mouth.

Of course you have printed the supplier propaganda, e.g., balsa is scarce, a disease is infesting the balsa crop, etc. Well, after seeing a price list of balsa and other supplies over in Europe in comparison with ours, I feel it is about time the modelers in the good old USA did a little boycotting.

Phil Melanson, North Hero, Vt.

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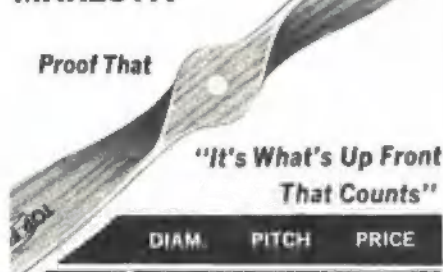
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*Model Airplane News, May 1968

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